ONKYO
SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-7640

Black model

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

TABLE OF CONTENTS

Specifications · · · · · · · · · · 2
Service procedures · · · · · · · · · · 3
Exploded view · · · · · · · · · · 4
Parts list · · · · · · · · · · 5
Connection diagram of microprocessor · · · · · · · · · · 6
Block diagram of IC · · · · · · · · · · 7
Adjustment procedures · · · · · · · · · · 14

Pc board view/parts list

  Display/preamp./speaker · · · · · · · · · · 17
  AM/FM tuner and selector circuit · · · · · · · · · · 21
  Power amplifier · · · · · · · · · · 26
  Other pc boards · · · · · · · · · · 27

Schematic diagram

  Tuner · · · · · · · · · · 19
  Amp. · · · · · · · · · · 23
Block diagram · · · · · · · · · · 29
Disassembling procedures · · · · · · · · · · 31
Packing view · · · · · · · · · · 32

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power output:	70 watts per channel, min, RMS, at 8ohms, both channels driven,from 20Hz to 20kHz, with no more than 0.04% total harmonic distortion.	
Musical Power Output:	2×180 watts at 4 ohms, 1kHz (DIN)	
	2×120 watts at 8 ohms, 1kHz (DIN)	
Continuous Power Output:	2×105 watts at 4 ohms, 1kHz (DIN)	
	2×77 watts at 8 ohms, 1kHz (DIN)	
Total Harmonic Distortion:	0.04% at rated power	
	0.04% at 1 watts output	
IM Distortion:	0.04% at rated power	
	0.04% at 1 watts output	
Damping Factor:	40 at 8 ohms	
Frequency Response:	20-30,000Hz ±1dB	
RIAA Diviation:	20-20,000Hz ±0.8dB	
Sensitivity and Impedance:	Phono:	2.5mV/50 kohms
	CD:	150mV/50 kohms
	Tape Play:	150mV/50 kohms
	Tape Rec:	150mV/3.5 kohms
Phono Overload(MM):	120mV RMS at 1kHz, 0.04% THD.	
Signal-to-Noise Ratio:	Phono:	85dB(at 10mV input, A weighted)
		75dB(IHF A-202)
	CD/Tape:	95dB(A weighterd)
		80dB(IHF A-202)
Tone controls:	Bass:	±10dB at 100Hz
	Treble:	±10dB at 10kHz

TUNER SECTION

FM:

Tuning Range:	87.50-108.00MHz(50kHz steps)	
Usable Sensitivity:	Mono:	11.2dBf,1.0 μV,75ohms
		0.9 μV(S/N 26dB,40kHz Devi.) 75ohms DIN
	Stereo:	18.0dBf,2.2 μV,75ohms
		23μV(S/N 46dB,40kHz Devi.) 75ohms DIN
50dB Quieting Sensitivity:	Mono:	18.0dBf,2.2 μV,75ohms
	Stereo:	37.2dBf,20μV,75ohms
Capture Ratio:	1.5dB	
Image Rejection Ratio:	85dB	
IF Rejection Ratio:	90dB	
Signal-to-Noise Ratio:	Mono:	73dB
	Stereo:	67dB
Selectivity:	50dB DIN(±300kHz,40kHz dev.)	
AM suppression Ratio:	50dB	
Harmonic Distortion:	Mono:	0.15%
	Stereo:	0.25%
Frequency Response:	30-15,000Hz ±1.5dB	
Stereo Separation:	45dB at 1kHz	
	30dB at 100-10,000Hz	
Muting Level:	17.2dBf, 4.0μV	

AM:

Tuning Range:	522-1611kHz(9kHz steps)
Usable Sensitivity:	30μV
Image Rejection Ratio:	40dB
IF Rejection Ratio:	40dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.7%

GENERAL

Dimensions(W×H ×D):	435×130×351mm 17-1/8" ×5-1/8 " ×13-13/16"
Weight:	8.8kg., 19.4lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

Circuit no.	Part no.	Description
F902	252075	2.5A-SE-EAK, Primary
F903	252075	2.5A-SE-EAK, AC outlet

2. Change of FM/AM band step.

With the exception of the models below, a BAND STEP selector switch is not provided.

(FM)

MODEL	BAND STEP	D717, J753	R119
UD	200kHz→50kHz	Additional	15kΩ→24kΩ
UG/UQ	50kHz→200kHz	Eliminated	24kΩ→15kΩ

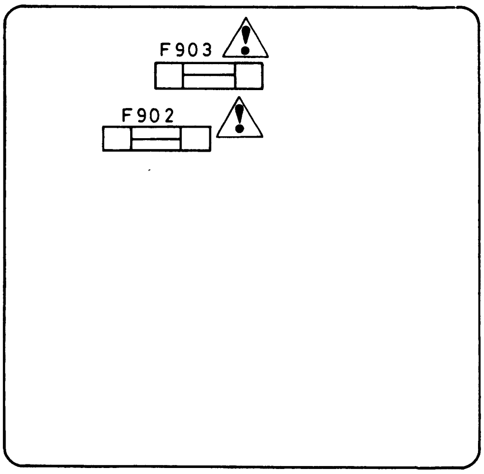
(AM)

BAND STEP	D716, J754
10kHz→ 9kHz	Additional
9kHz→10kHz	Eliminated

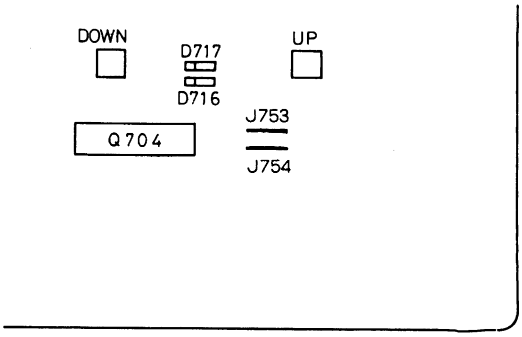
In D716/7 1SS133 (Part No. 223163) is used. In J753/4, a jumper lead must be inserted. R119, with the muting amplitude determined is on the back panel side of FM/AM tuner and selector circuit printed circuit board assembly test points TP-1 and TP-2.

3. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

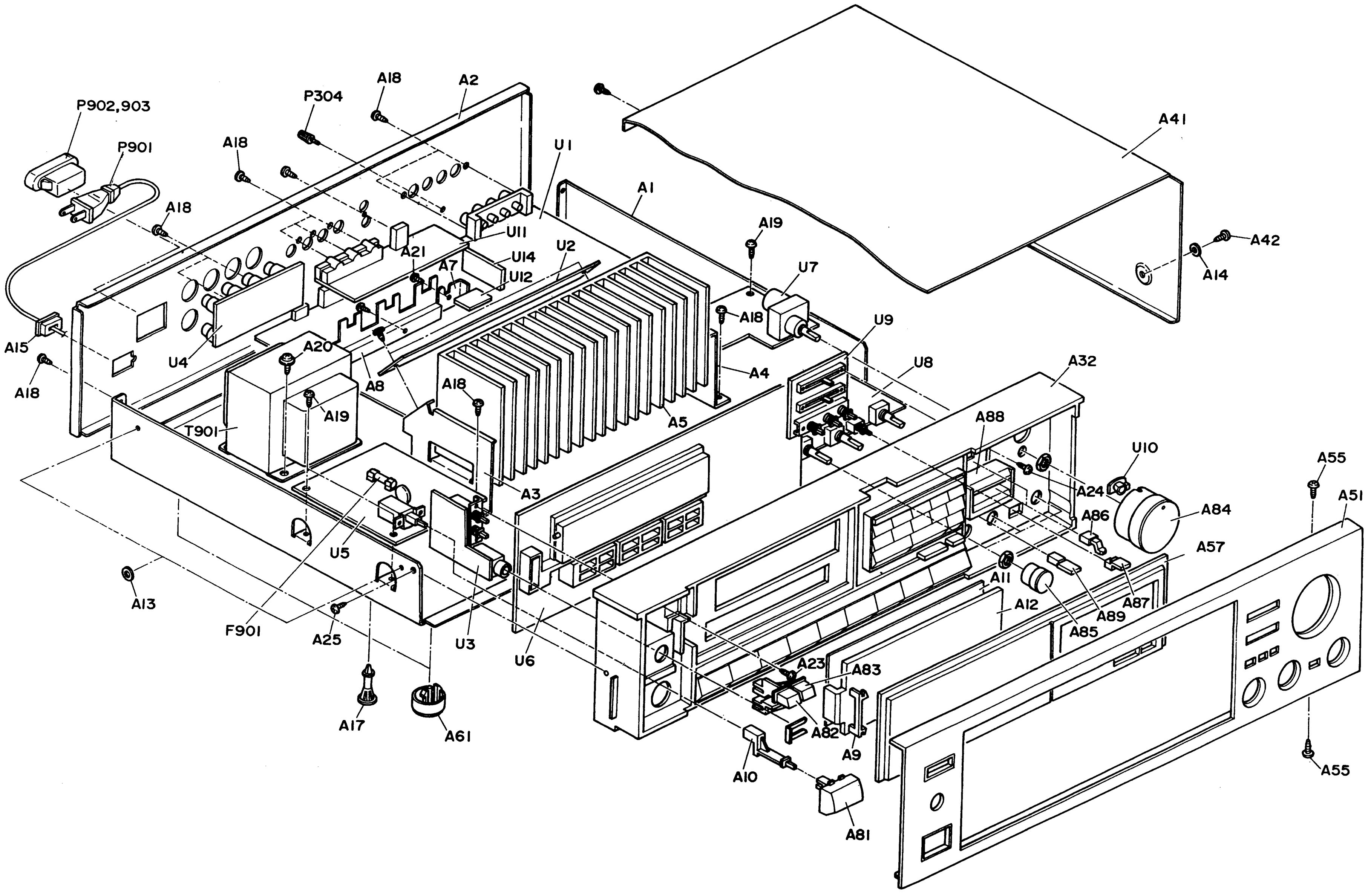


POWER SUPPLY CIRCUIT PC BOARD



DISPLAY PC BOARD

EXPLODED VIEW

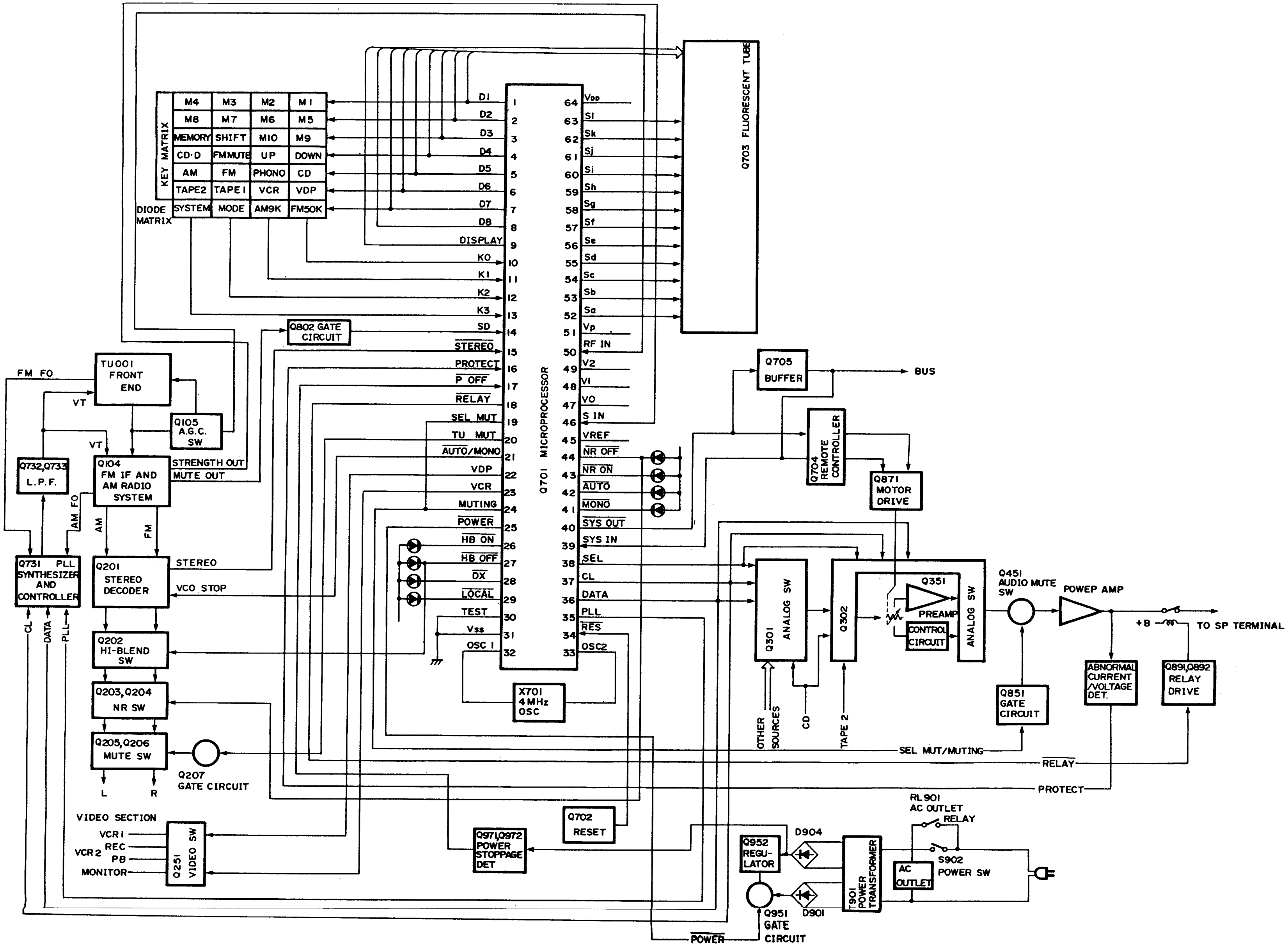

P902,903
P901
A18
P304
A18
A2
A41
U1
A1
A18
U11
A21
U14
A7
U12
U2
A19
U7
A42
A14
A15
A18
U4
A20
A18
A8
U9
A4
U8
A32
A19
T901
A18
A5
A88
U10
A55
A3
A24
A84
A51
A86
A57
U5
A11
A12
A13
A89
A87
F901
A25
U3
U6
A85
A23
A83
A82
A9
A17
A61
A10
A55
A81

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27100163-1	Chassis
A2	27121255-3	Back panel
A3	27141261A	Bracket LH
A4	27141262	Bracket RH
A5	27160225	Radiator
A7	27141263	Bracket SH
A8	27141264	Bracket H
A9	27190644	Holder,dial plate
A10	27273098B	Joint,power
A11	28133224	Back plate
A12	28130255	Dial plate
A13	27270147	Spacer
A14	870048	3 ×8 ×0.8t,Nylon washer
A15	27300750	⚠ Strainrelief
A17	27190524	Holder
A18	834430088	3TTS+8B(BC),Tapping screw
A19	831130088	3TTW+8B,Tapping screw
A20	830440089	4TTC+8C(BC),Tapping screw
A21	834430108	3TTS+10B(BC),Tapping screw
A23	82143006	3P+6FN(BC),Pan head screw
A24	82142004	2P+4F(BC),Pan head screw
A25	833430080	3TTP+8P(BC),Pan head screw
A32	27110491A	Front bracket ass'y
A41	28184394	Top cover
A42	834430088	3TTS+8B(BC),Tapping screw
A51	1A157121	Front panel ass'y
A55	833430080	3TTP+8P(BC),Tapping screw
A57	28191466-1A	Clear plate
A61	27175221A	Leg
A81	28323241-1A	Knob POWER
A82	28323361	Knob SPEAKER A
A83	28323363	Knob SPEAKER B
A84	28323365B	Knob VOLUME
A85	28323310	Knob TONE
A86	28322925	Knob SLIDE
A87	28323367	Knob PUSH
A88	27190647	Holder SLIDE
A89	28323369	Knob PUSH
F902	252075	⚠ 2.5A-SE-EAK,Primary fuse
F903	252075	⚠ 2.5A-SE-EAK,AC outlet fuse
P304	25060044	14×3mm,Terminal GROUND
P901	253148 or 253150	⚠ AS-CEE,Power supply cord
P902,P903	25050337	⚠ NSCT-2P104,AC outlet
Q521,Q522	2501653, 2501654 or *2501655*	2SC3856(O), 2SC3856(Y) or *2SC3856(P),Power amplifier transis*tor
Q523,Q524	2501663, 2501664 or 2501665	2SA1492(O), 2SA1492(Y) or 2SA1492(P),Power amplifier transistor
T901	2300304	⚠ NPT-992G,Power transformer
U1	1A156576-3A	NAAR-3276-3A,FM/AM tuner and selector circuit pc board ass'y
U2	1A156577-3	NAAF-3277-3, Power amplifier pc board ass'y
U3	1A156578-3	NASW-3278-3,Speaker switch pc board ass'y
U4	1A156579-3A	NAETC-3279-3A,Speaker terminal pc board ass'y
U5	1A156580-3	NAETC-3280-3, Const. voltage circuit pc board ass'y
U6	1A156581-3A	NADIS-3281-3A,Display pc board ass'y
U7	1A156574-1	NAAF-3574-1, Volume pc board ass'y
U8	1A156583-3A	NAAF-3283-3A,Preamplifier pc board ass'y
U9	1A156584-3	NAAF-3284-3, Switch pc board ass'y
U10	1A156575-1	NADIS-3575-1, Volume indicator pc board ass'y
U11	1A156586-3A	NAETC-3286-3A,Video terminal pc board ass'y
U12	1A156587-3A	NAPS-3287-3A,Power supply circuit pc board ass'y
U14	1A086554-3	NAAF-3054-3, Equalizer amplifier pc board ass'y

NOTE: THE COMPONENTS IDENTIFIED BY MARK⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

CONNECTION VIEW OF MICROPROCESSOR


KEY MATRIX
M4 M3 M2 M1
M8 M7 M6 M5
MEMORY SHIFT M10 M9
CD·D FMMUTE UP DOWN
AM FM PHONO CD
TAPE2 TAPE1 VCR VDP
SYSTEM MODE AM9K FM50K
DIODE MATRIX
Q703 FLUORESCENT TUBE
Q701 MICROPROCESSOR
D1 1
D2 2
D3 3
D4 4
D5 5
D6 6
D7 7
D8 8
DISPLAY 9
K0 10
K1 11
K2 12
K3 13
SD 14
STEREO 15
PROTECT 16
P OFF 17
RELAY 18
SEL MUT 19
TU MUT 20
AUTO/MONO 21
VDP 22
VCR 23
MUTING 24
POWER 25
HB ON 26
HB OFF 27
DX 28
LOCAL 29
TEST 30
Vss 31
OSC 1 32
64 VDD
63 Sl
62 Sk
61 Sj
60 Si
59 Sh
58 Sg
57 Sf
56 Se
55 Sd
54 Sc
53 Sb
52 Sa
51 Vp
50 RF IN
49 V2
48 V1
47 VO
46 S IN
45 VREF
44 NR OFF
43 NR ON
42 AUTO
41 MONO
40 SYS OUT
39 SYS IN
38 SEL
37 CL
36 DATA
35 PLL
34 RES
33 OSC2
X701 4MHz OSC
Q802 GATE CIRCUIT
TU001 FRONT END
FM FO
VT
VT
Q105 A.G.C. SW
Q104 FM IF AND AM RADIO SYSTEM
STRENGTH OUT
MUTE OUT
Q732,Q733 L.P.F.
AM FO
AM
FM
Q731 PLL SYNTHESIZER AND CONTROLLER
CL
DATA
PLL
Q201 STEREO DECODER
STEREO
VCO STOP
Q202 HI-BLEND SW
Q203,Q204 NR SW
Q205,Q206 MUTE SW
L
R
Q207 GATE CIRCUIT
VIDEO SECTION
VCR1
VCR2 REC
PB
MONITOR
Q251 VIDEO SW
Q971,Q972 POWER STOPPAGE DET
Q702 RESET
Q705 BUFFER
BUS
Q704 REMOTE CONTROLLER
Q871 MOTOR DRIVE
Q301 ANALOG SW
Q302
Q351
PREAMP
CONTROL CIRCUIT
ANALOG SW
OTHER SOURCES
CD
TAPE 2
Q451 AUDIO MUTE SW
POWEP AMP
+B
TO SP TERMINAL
Q851 GATE CIRCUIT
ABNORMAL CURRENT /VOLTAGE DET.
Q891,Q892 RELAY DRIVE
SEL MUT/MUTING
RELAY
PROTECT
RL901 AC OUTLET
RELAY
S902 POWER SW
AC OUTLET
T901 POWER TRANSFORMER
D904
D901
Q952 REGU-LATOR
Q951 GATE CIRCUIT
POWER

BLOCK DIAGRAM OF ICS

LC6568H-3643 (MICROPROCESSOR)

Terminal Descriptions

Pin No.	Terminal	Description
1 2 3 4 5 6 7 8	D1 D2 D3 D4 D5 D6 D7 D8	These are the digit and key scan signal terminals. "H" when active.
9	DISPLAY	Display output terminal."H" when active.
10 11 12 13	K0 K1 K2 K3	These are the input terminal for key return signal source and diode matrix."H" when active.
14	SD	Auto stop signal input terminal.Auto tuning stops when this terminal becomes the high level.
15	$\overline{\text{STEREO}}$	This is the input terminal for detection of the stereo broadcast."L" when active.
16	PROTECT	This is the detection terminal for protection circuit.The speaker relay turns off when this terminal becomes the high level.
17	$\overline{\text{POWER OFF}}$	This is the input terminal for detection of the stoppage of electric current."L" when the stoppage of electric current.
18	$\overline{\text{RELAY}}$	This is the output terminal for control of the speaker relay."L" when active.
19	SEL MUTE	This is the muting output terminal when the selector key is operated."H" when active.
20	TU MUTE	This is the output terminal for muting control of tuner section."L" when active.
21	$\overline{\text{AUTO}}$/MONO	This is the AUTO/MONO switching output terminal. "L" when AUTO.
22 23	VDP VCR	These are the output terminal for control of video signal.
24	MUTING	This is the output terminal for muting control. "H" when active.
25	POWER	This is the output terminal for power source.It is "H" for power on.
26	$\overline{\text{HB ON}}$	This is the output terminal for indication of HI-BLEND ON. "L" when active.
27	$\overline{\text{HB OFF}}$	This is the output terminal for indication of HI-BLEND OFF. "L" when active.
28	$\overline{\text{DX}}$	This is the output terminal for indication of DX. "L" when active.
29	$\overline{\text{LOCAL}}$	This is the output terminal for indication of LOCAL. "L" when active.
30	TEST	Test terminal.Connect to the ground.
31	Vss	Ground terminal.
32 33	OSC1 OSC2	Connect to the 4.00MHz ceramic oscillator.
34	$\overline{\text{RES}}$	This is the input terminal for reset. "L" when active
35	PLL	Connect to the terminal CE of PLL IC(LM7001).
36	DATA	This is the serial data output terminal.Connect to the terminal DATA of PLL IC and terminal DI of analog switches. (LC7821/LC7823)
37	CLOCK	This is the serial clock output terminal.Connect to the terminal CI of PLL IC and terminal CL of analog switches.
38	SEL	Connect to terminal SEL of analog switch(LC7821).
39	SYSTEM IN	This is the input terminal for system code. "H" when active.
40	$\overline{\text{SYSTEM OUT}}$	This is the input terminal for system code. "L" when active.
41	$\overline{\text{MONO}}$	This is the output terminal for indication of MONO. "L" when active.
42	$\overline{\text{AUTO}}$	This is the output terminal for indication of AUTO. "L" when active.
43	$\overline{\text{NR ON}}$	This is the output terminal for indication of NR ON. "L" when active.
44	$\overline{\text{NR OFF}}$	This is the output terminal for indication of NR OFF. "L" when active.
45	VREF	This is the input terminal for comparator reference voltage.
46	S IN	This is the signal strength input terminal.
47	V0	This is the output terminal for comparator reference voltage.
48	V1	This is the output terminal for comparator reference voltage.
49	V2	This is the output terminal for comparator reference voltage.
50	RF IN	This is the input terminal for control of AGC. "H" when active.
51	VP	Pull-down resistor connection terminal of FIP controller/driver.

Pin No.	Terminal	Description
52 53 54 55 56 57 58 59 60 61 62 63	Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl	These are the output terminal for segment signal. "H" when active.
64	VDD	This is the divice power source terminal.At the time of operation,the supply is 5V.The internal data memory(RAM) is maintained by means of the super capacitor.

FM50K (FM band setting)

FM50K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europer	87.50 ~108.00MHz	50kHz	25kHz	10.7MHz
0	U.S.A.	87.9 ~107.9MHz	200kHz	25kHz	10.7MHz

AM9

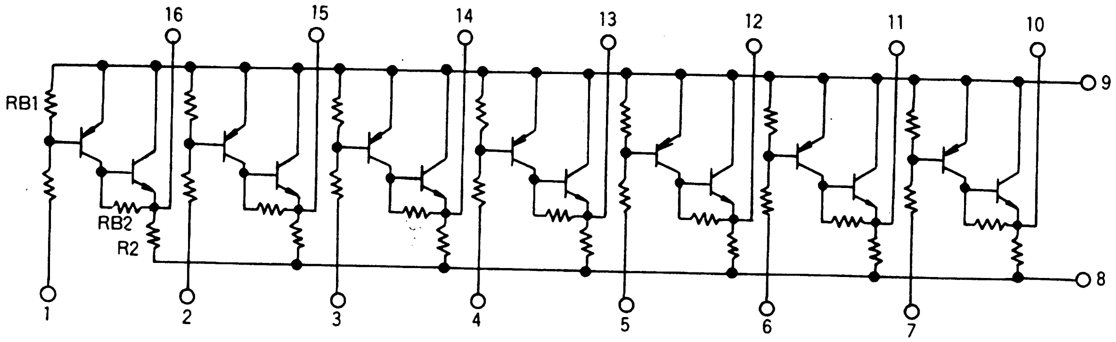
AM9K	Region	Frequency range	Channel space	Reference frequency	IF frequency
1	Europer	522 ~ 1611 kHz	9kHz	9kHz	450kHz
0	U.S.A.	530 ~ 1620 kHz	10kHz	10kHz	450kHz

Connection of fluorescent tube and microprocessor

ANODE CONNECTION

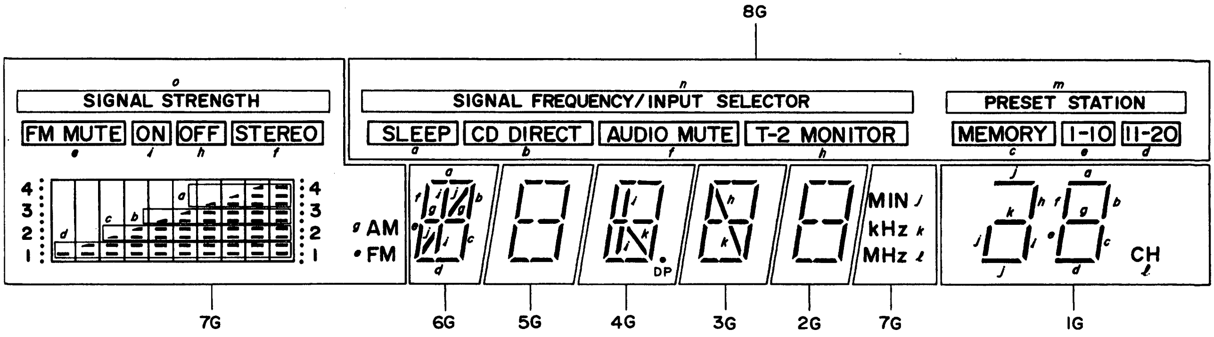
	8 G(D 8)	7 G(D 7)	6 G(D 6)	5 G(D 5)	4 G(D 4)	3 G(D 3)	2 G(D 2)	1 G(D 1)
a	SLEEP	▬▬▬▬	a	a	a	a	a	a
b	CD DIRECT	▬▬▬▬▬▬	b	b	b	b	b	b
c	MEMORY	▬▬▬▬▬▬▬▬	c	c	c	c	c	c
d	11-20	▬▬▬▬▬▬▬▬▬▬▬	d	d	d	d	d	d
e	1-10	FM FM MUTE	e	e	e	e	e	e
f	AUDIO MUTE	STEREO	f	f	f	f	f	f
g	–	AM	g	g	g	g	g	g
h	T-2 MONITOR	OFF	–	–	–	h	–	h
i	–	ON	i	–	i	–	–	i
j	–	MIN	j	–	–	–	–	j
k	–	kHz	–	–	k	k	–	k
ℓ	–	MHZ	–	–	DP	–	–	CH
m	PRESET STATION	–	–	–	–	–	–	–
n	SIGNAL FREQUENCY /INPUT SELECTOR	–	–	–	–	–	–	–
o	–	SIGNAL STRENGTH	–	–	–	–	–	–
p 常時点灯	–		–	–	–	–	–	–

μPA81C (BUFFER)

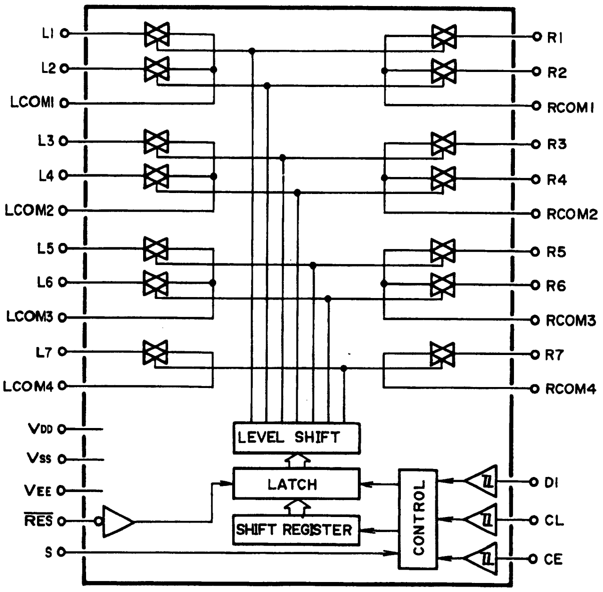


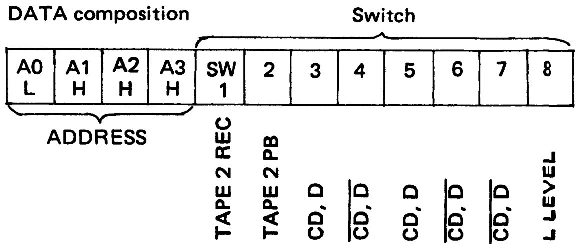
RB1 : 20KΩ R1 : 20KΩ RB2 : 2KΩ R2 : 100KΩ

7-BT-95GK (FLUORESCENT TUBE)


8G
SIGNAL STRENGTH
FM MUTE
ON
OFF
STEREO
SIGNAL FREQUENCY/INPUT SELECTOR
SLEEP
CD DIRECT
AUDIO MUTE
T-2 MONITOR
PRESET STATION
MEMORY
1-10
11-20
AM
FM
MIN
kHz
MHz
CH
DP
4
3
2
1
7G
6G
5G
4G
3G
2G
7G
1G

LC7823 (ANALOG SWITCH)

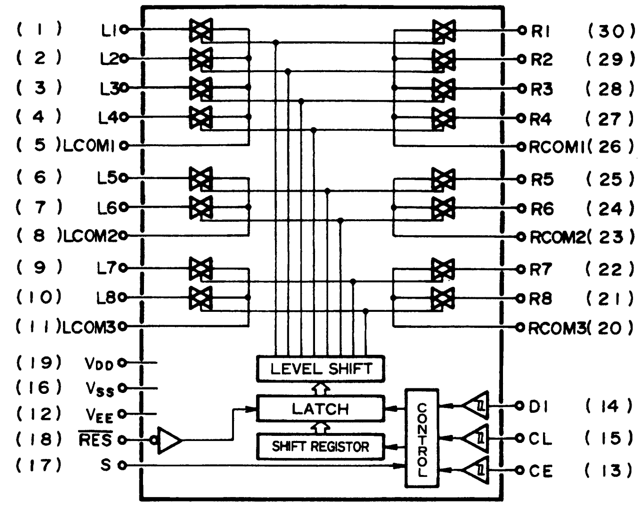

L1
L2
LCOM1
L3
L4
LCOM2
L5
L6
LCOM3
L7
LCOM4
VDD
VSS
VEE
RES
S
R1
R2
RCOM1
R3
R4
RCOM2
R5
R6
RCOM3
R7
RCOM4
LEVEL SHIFT
LATCH
SHIFT REGISTER
CONTROL
DI
CL
CE

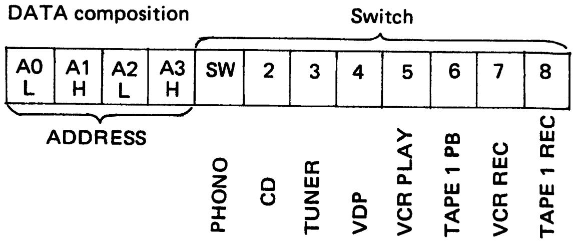

DATA composition
Switch
A0
L
A1
H
A2
H
A3
H
SW
1
2
3
4
5
6
7
8
ADDRESS
TAPE 2 REC
TAPE 2 PB
CD, D
CD, D
CD, D
CD, D
CD, D
L LEVEL

The source becomes ON when the bit of switch becomes high.

Pin No.	Terminal	Description
1 (L1)	TAPE 2 REC	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.
2 (L2)	TAPE 2 PB	
3	L COM 1	
4 (L3)	CD·D	
5 (L4)	$\overline{\text{CD·D}}$	
6	L COM 2	
7 (L5)	CD·D	
8 (L6)	$\overline{\text{CD·D}}$	
9	L COM 3	
10 (L7)	$\overline{\text{CD·D}}$	
11	L COM 4	
12	VEE	Negative power supply terminal. (–15V)
13	CE	Chip enable terminal. Connect to SEL terminal of LC6568H-3643.
14	D1	Serial data input terminal. Connect to DATA terminal of LC6868H-3643.
15	CL	Serial clock input terminal. Connect to CLOCK terminal of LC6868H-3643.
16	Vss	Ground terminal.
17	S	Selector terminal.
18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
19	VDD	Power supply terminal. (+15V)
20	R COM 4	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.
21 (R7)	$\overline{\text{CD·D}}$	
22	R COM 3	
23 (R6)	$\overline{\text{CD·D}}$	
24 (R5)	CD·D	
25	R COM 2	
26 (R4)	$\overline{\text{CD·D}}$	
27 (R3)	CD·D	
28	R COM 1	
29 (R2)	TAPE 2 PB	
30 (R1)	TAPE 2 REC	

LC7821 (ANALOG SWITCH)


(1) L1
(2) L2
(3) L3
(4) L4
(5)LCOM1
(6) L5
(7) L6
(8)LCOM2
(9) L7
(10) L8
(11)LCOM3
(19) VDD
(16) VSS
(12) VEE
(18) RES
(17) S
R1 (30)
R2 (29)
R3 (28)
R4 (27)
RCOM1(26)
R5 (25)
R6 (24)
RCOM2(23)
R7 (22)
R8 (21)
RCOM3(20)
DI (14)
CL (15)
CE (13)
LEVEL SHIFT
LATCH
SHIFT REGISTOR
CONTROL

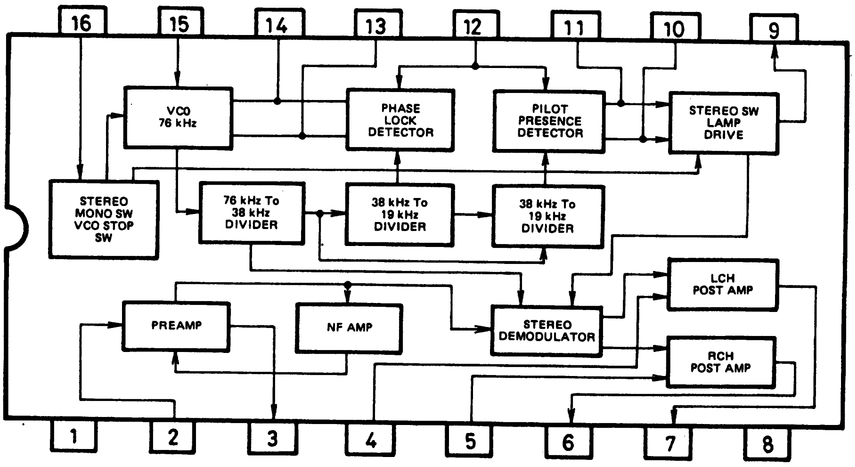

DATA composition
Switch
A0 L
A1 H
A2 L
A3 H
SW
2
3
4
5
6
7
8
ADDRESS
PHONO
CD
TUNER
VDP
VCR PLAY
TAPE 1 PB
VCR REC
TAPE 1 REC

The source becomes ON when the bit of switch becomes high.

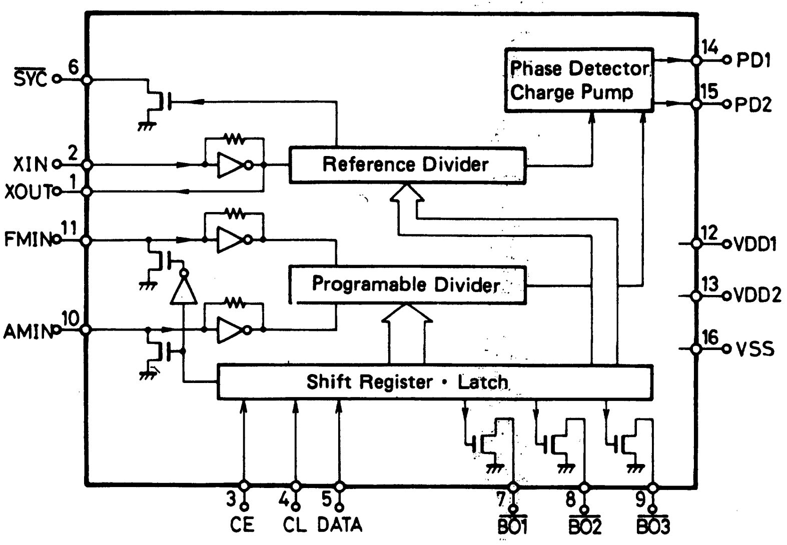
Pin No.	Terminal	Description
1	PHONO	Input/output terminals of audio signal of left channel. Control to the inside analog switch at the serial data.
2	CD	
3	TUNER	
4	VDP	
5	L COM 1	
6	VCR PB	
7	TAPE 1 PB	
8	L COM 2	
9	VCR REC	
10	TAPE 1 REC	
11	L COM 3	
12	Vss	Negative power supply terminal. (−15V)
13	CE	Chip enable terminal. Connect to SEL terminal of LC6568H-3643.
14	D1	Serial data input terminal. Connect to DATA terminal of LC6868H-3643.
15	CL	Serial clock input terminal. Connect to CLOCK terminal of LC6868H-3643.

Pin No.	Terminal	Description
16	Vss	Ground terminal.
17	S	Selector terminal.
18	RES	Reset terminal. When power is turned ON, the condition of the analog switch is not determined, but when this terminal is "L", all analog switches are OFF.
19	VDD	Power supply terminal. (+15V)
20	R COM 3	Input/output terminals of audio signal of right channel. Control to the inside analog switch at the serial data.
21	TAPE 1 REC	
22	VCR REC	
23	R COM 2	
24	TAPE 1 PB	
25	VCR P	
26	R COM 1	
27	VDP	
28	TUNER	
29	CD	
30	PHONO	

µPC1161C3 (STEREO DECODER)

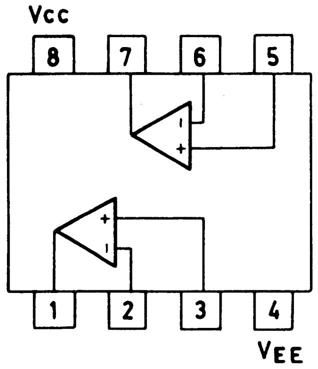

16
15
14
13
12
11
10
9
VCO 76 kHz
PHASE LOCK DETECTOR
PILOT PRESENCE DETECTOR
STEREO SW LAMP DRIVE
STEREO MONO SW VCO STOP SW
76 kHz To 38 kHz DIVIDER
38 kHz To 19 kHz DIVIDER
38 kHz To 19 kHz DIVIDER
LCH POST AMP
PREAMP
NF AMP
STEREO DEMODULATOR
RCH POST AMP
1
2
3
4
5
6
7
8

LM7001 (PLL SYNTHESIZER AND CONTROLLER)

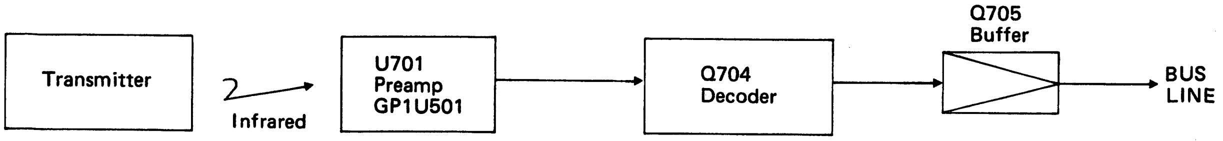

SYC 6
XIN 2
XOUT 1
FMIN 11
AMIN 10
Phase Detector
Charge Pump
Reference Divider
Programable Divider
Shift Register • Latch
14 PD1
15 PD2
12 VDD1
13 VDD2
16 VSS
3 CE
4 CL
5 DATA
7 BO1
8 BO2
9 BO3

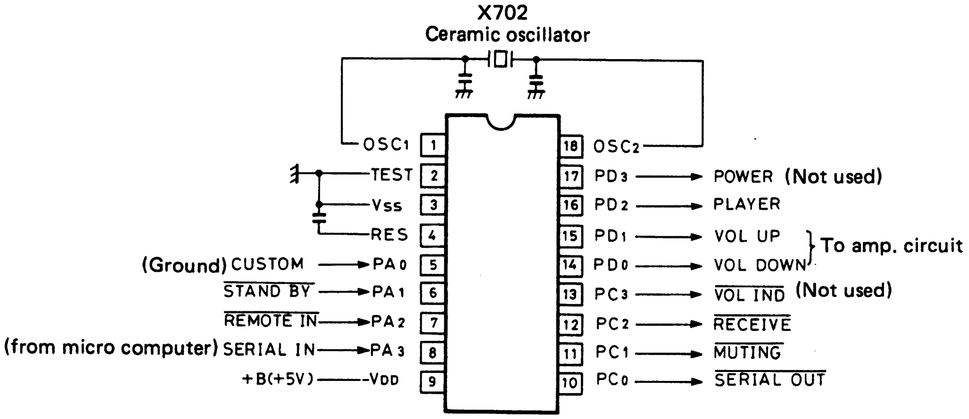
Pin No.	Terminal	Description
1	XOUT	Connect to the 7.2 MHz crystal oscillator.
2	XIN	
3	CE	Chip enable terminal. Connect to the PLL terminal of LC6568H-3643.
4	CL	Serial clock input terminal. Connect to the CLOCK terminal of LC6568H-3643.
5	DATA	Serial data input terminal. Connect to the DATA terminal of LC6568H-3643.
6	$\overline{\text{SYN}}$	Not used.
7	$\overline{\text{BO1}}$	Phono control signal output terminal. "L" when phono.
8	$\overline{\text{BO2}}$	FM control signal output terminal. "L" when FM.
9	$\overline{\text{BO3}}$	AM control signal output terminal. "L" when AM.
10	AMIN	AM local oscillator input terminal.
11	FMIN	FM local oscillator terminal.
12	VDD 1	Power supply terminal for back-up.
13	VDD 2	Power supply terminal.
14	PD1	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided local oscillator frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies matched. The output is applied to the variable capacitor diode in the local oscillator through the low pass filters.
15	PD2	
16	Vss	Ground terminal.

µPC4570C (OP AP)


Vcc
8
7
6
5
1
2
3
4
VEE

LC6527C-3987 (REMOTE CONTROLLER)

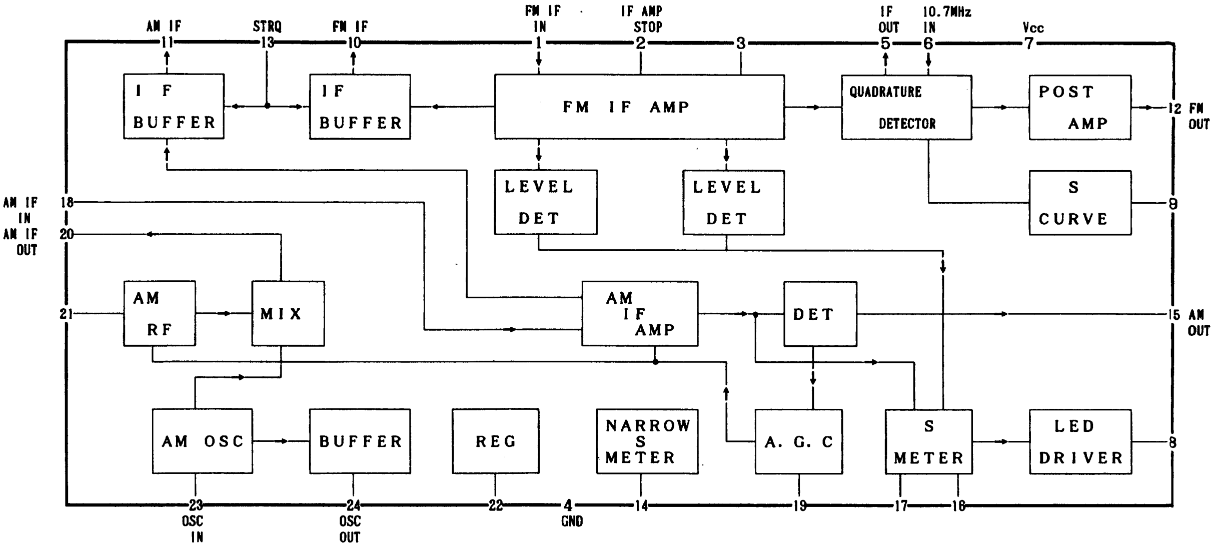

Transmitter
Infrared
U701
Preamp
GP1U501
Q704
Decoder
Q705
Buffer
BUS
LINE


X702
Ceramic oscillator
OSC1 1
TEST 2
Vss 3
RES 4
(Ground) CUSTOM → PA0 5
STAND BY → PA1 6
REMOTE IN → PA2 7
(from micro computer) SERIAL IN → PA3 8
+B(+5V) — VDD 9
18 OSC2
17 PD3 → POWER (Not used)
16 PD2 → PLAYER
15 PD1 → VOL UP
14 PD0 → VOL DOWN
To amp. circuit
13 PC3 → VOL IND (Not used)
12 PC2 → RECEIVE
11 PC1 → MUTING
10 PC0 → SERIAL OUT

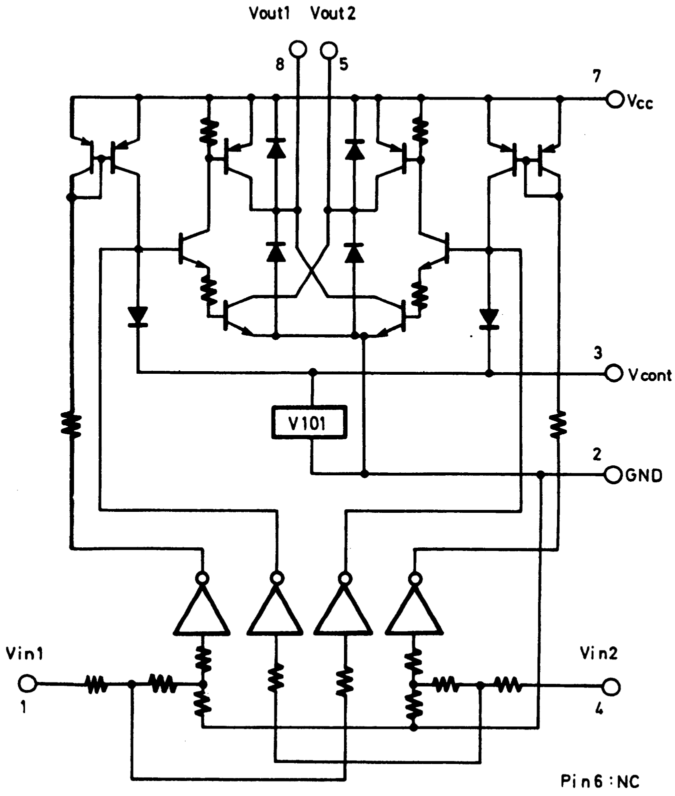
Connection diagram

Terminal No.	Symbol	Terminal	Description
1 18	OSC1 OSC2	OSC	Connect to the 4MHz ceramic oscillator.
2	TEST	TEST	Test terminal. Connect to the ground.
3	Vss	GND	Ground terminal.
4	$\overline{\text{RES}}$	$\overline{\text{RES}}$	Reset terminal.
5	PA0	CUSTOM	The custom code for decode is selected at this terminal. For U.S.A., the level is low.
6	PA1	$\overline{\text{STANDBY}}$	Terminal for STANDBY detection. During low input, only the POWER code is decoded.
7	PA2	$\overline{\text{REMOTE IN}}$	Signal input terminal for remote control preamp. Active low.
8	PA3	SERIAL IN	Serial data input terminal from microprocessor.
9	VDD	+B	Power supply terminal.
10	PC0	$\overline{\text{SERIAL OUT}}$	Output at this terminal are the custom code (16 bit) remote control code input to REMOTE IN, data code (8 bit), and the serial code (12 bit) that has been converted corresponding to the decoded data code (8 bit).
11	PC1	$\overline{\text{MUTING}}$	At this terminal, the audio muting code that is input is inverted for each L/H. When power is ON, the level is high.
12	PC2	$\overline{\text{RECEIVE}}$	This is the display output for remote control reception. Output is low when decoded code is being received.
13	PC3	$\overline{\text{VOL IND}}$	During output of VOLUME UP/DOWN, a pulse (┌T┐└T┘┌T┐; T = 0.3ms) is output.
14	PD0	VOL DOWN	When the volume DOWN code is input, a high pulse of 120ms is output.
15	PD1	VOL UP	When the volume UP code is input, a high pulse of 120ms is output.
16	PD2	PLAYER	When the player PLAY/REJECT is input, a high pulse of 200ms is output.
17	PD3	POWER	The power code input inverts the L/H. Level is high for power being turned ON.

LA1266 (FM IF AND AM RADIO SYSTEM)

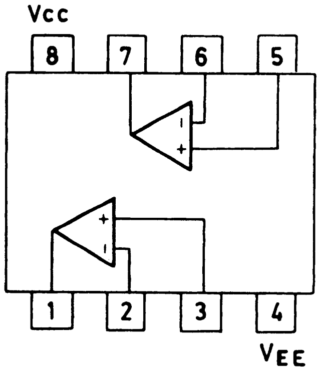

AM IF
STRQ
FM IF
FM IF IN
IF AMP STOP
IF OUT
10.7MHz IN
Vcc
I F BUFFER
IF BUFFER
FM IF AMP
QUADRATURE DETECTOR
POST AMP
12 FM OUT
LEVEL DET
LEVEL DET
S CURVE
AM IF IN
AM IF OUT
AM RF
MIX
AM IF AMP
DET
15 AM OUT
AM OSC
BUFFER
REG
NARROW S METER
A. G. C
S METER
LED DRIVER
OSC IN
OSC OUT
GND

LB1630 (MOTOR DRIVE)

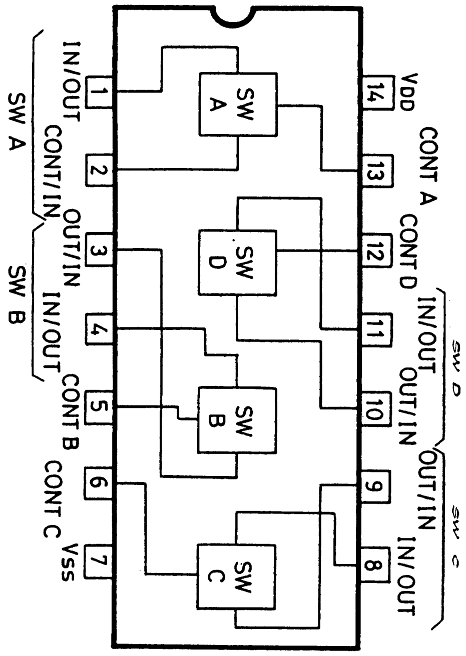

Vout1
Vout2
8
5
7
Vcc
3
Vcont
V101
2
GND
Vin1
1
Vin2
4
Pin6 : NC

IN1	IN2	OUT1	OUT 2	MOTOR
H	L	H	L	Normal
L	H	L	H	Reverse
H	H	OFF	OFF	Wait
L	L	OFF	OFF	Wait

NJM4558D/4560D/DX (OP AMP)


Vcc
8
7
6
5
1
2
3
4
VEE

4066B (ANALOG SWITCH)


IN/OUT
SW A
CONT/IN
OUT/IN
SW B
IN/OUT
CONT B
CONT C
Vss
VDD
CONT A
CONT D
IN/OUT
OUT/IN
SW D
OUT/IN
IN/OUT
SW C
SW A
SW D
SW B
SW C
1
2
3
4
5
6
7
14
13
12
11
10
9
8

ADJUSTMENT PROCEDURES

Preparation

- **Input**

FM mono: 1kHz, 75kHz devi., 60dB/μV
FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.
AM: 400Hz, 30% mod.,

- **Output**

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

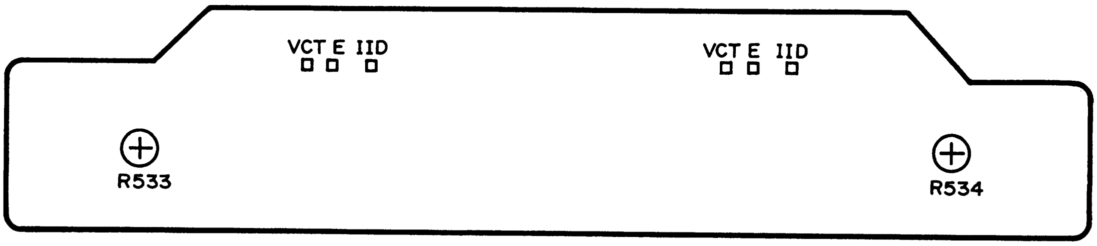
- **Standard knob position**

TAPE MONITOR	SOURCE
VOLUME	Maximum
BASS/TREBLE/BALANCE	Center
VCR 2 MODE	STEREO
SPEAKER	A
SIMULATED STEREO	OFF
DYNAMIC BASS EXPANDER	OFF
STEREO IMAGE EXPANDER	OFF
SELECTIVE TONE CONTROL	OFF

Amplifier section

1. Idling current adjustment

Connect the DC voltmeter to the terminals I ID and V CT on the power amplifier pc board.
Adjust the semi-fixed resistors R533 and R534 so that the indication of voltmeter is 7.5 ± 1.5mV.
Notes: VOLUME .... Maximum, Open load,
Adjust after switching on for 5 minutes.



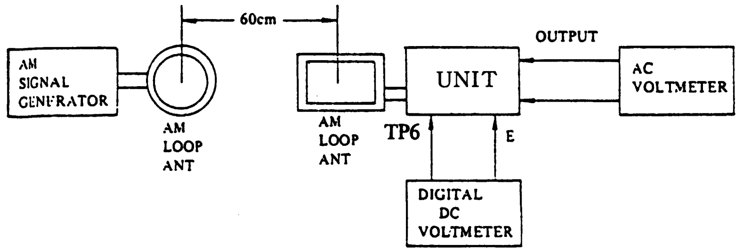
Power amplifier pc board

FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Turning dial setting	Output indicator	Adjustment	Adjust for	Remarks
FM IF	1	Fig. 1	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)	–	99.1MHz	DC voltmeter	L101	0V ± 20mV	Mode switch: MONO Repeat the steps 1 and 3 until no further adjustment is necessary
	2					AC voltmeter	IF on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
Stereo indicator level	1	Fig. 3	99.1MHz 17.2dBf (12dB) Ext. modulation	L + R : 1kHz 67.5kHz devi.	99.1MHz	Stereo indicator	R101	Light on	Mode switch: STEREO
	2		99.1MHz 16.2dBf (11dB) Ext. modulation	Pilot signal 19kHz 7.5kHz devi.				Light off	
VCO		Fig. 2	99.1MHz 1kHz, 75kHz devi. 65dBf (60dB)	–	99.1MHz	Frequency counter	R201	19kHz ± 10Hz	
Stereo Distortion		Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	L or Rch. 1kHz	99.1MHz	Distortion analyzer	IF on the front end	Minimum	Don't turn more than ±180 :
Stereo Separation	1	Fig. 3	99.1MHz 65dBf (60dB) Ext. modulation	Lch. 1kHz	99.1MHz	Rch. AC voltmeter	R202	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
Hi-blend level		Fig. 3	99.1MHz 35.2dBf (30dB) 1kHz, 75kHz devi.	–	99.1MHz	Hi-blend indicator	R102	Light off	

AM section

Step	AM SG output	Tuned frequency	Output indicator	Adjustment point	Adjust for
1		522kHz	Digital DC voltmeter	OSC on RF block	1.3V ± 0.1V
2	603kHz 400Hz 30% mod. 60dB/m	603kHz	AC voltmeter	RF on RF block	Maximum
3	999kHz 400Hz 30% mod. 60dB/m	999kHz	AC voltmeter	L152	Maximum
4	Same as above	999kHz	First signal indicator	R151	Light on


60cm
AM SIGNAL GENERATOR
AM LOOP ANT
AM LOOP ANT
UNIT
OUTPUT
AC VOLTMETER
TP6
E
DIGITAL DC VOLTMETER

Reference specifications

FM Tuned voltage	87.5MHz	2.0 ± 0.5V
	108.0MHz	7.7 ± 0.5V
Auto stop level	AM: Less than 66dB/m	
	FM: Less than 17dBμ	
AM Tuned voltage	522kHz	1.3 ± 0.5V
	1611kHz	8.0 ± 0.5V

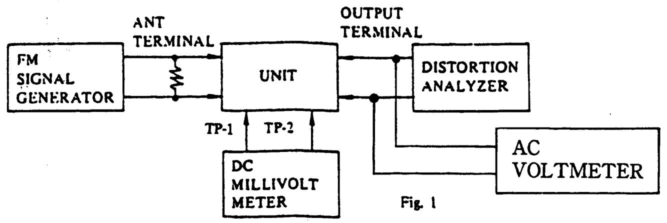
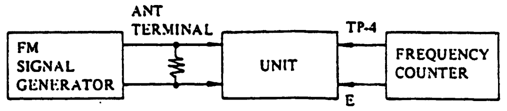

FM SIGNAL GENERATOR
ANT TERMINAL
UNIT
OUTPUT TERMINAL
DISTORTION ANALYZER
TP-1
TP-2
DC MILLIVOLT METER
AC VOLTMETER

Fig. 1


FM SIGNAL GENERATOR
ANT TERMINAL
UNIT
TP-4
E
FREQUENCY COUNTER

Use the high impedance probe. (10:1)

Fig. 2

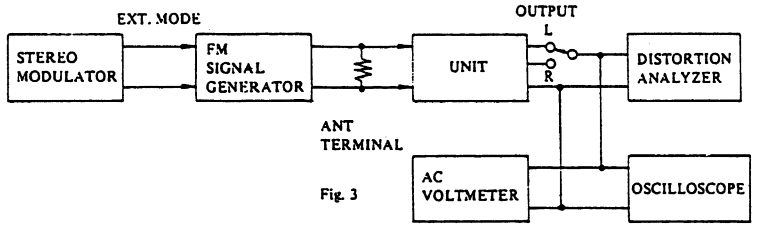
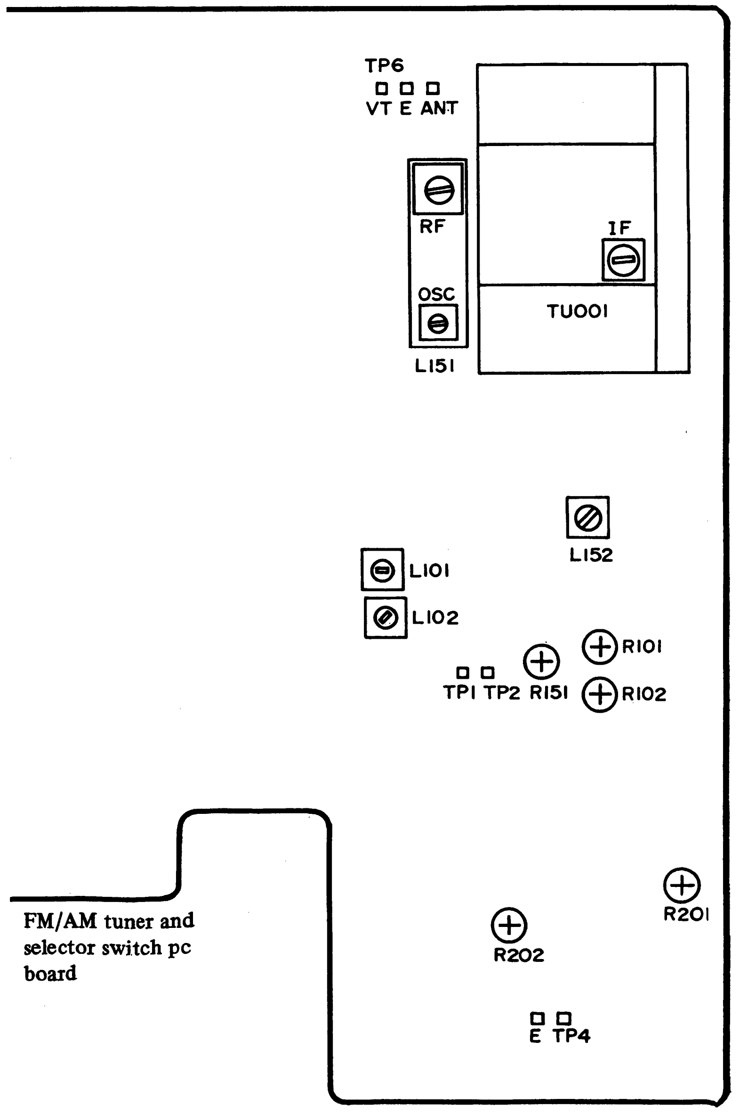
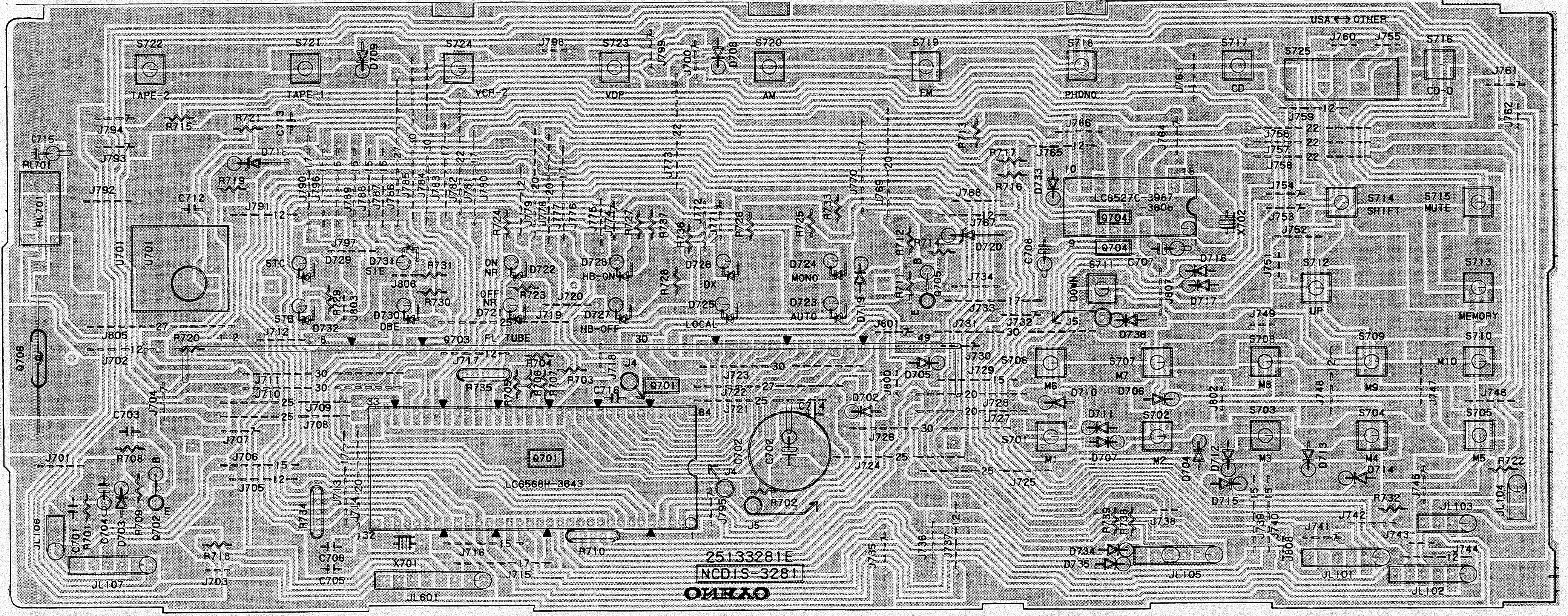

EXT. MODE
STEREO MODULATOR
FM SIGNAL GENERATOR
UNIT
OUTPUT
L
R
DISTORTION ANALYZER
ANT TERMINAL
AC VOLTMETER
OSCILLOSCOPE

Fig. 3

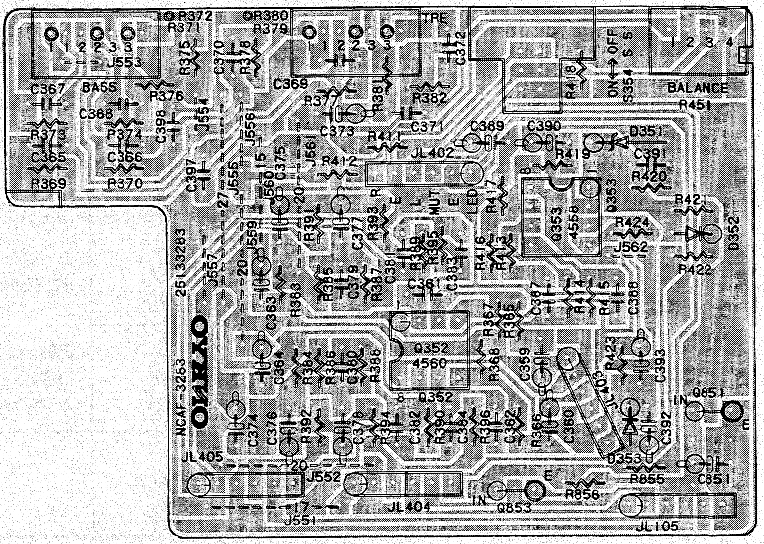

TP6
VT E ANT
RF
IF
OSC
TU001
L151
L152
L101
L102
R101
TP1 TP2 R151
R102
R201
R202
E TP4

FM/AM tuner and selector switch pc board

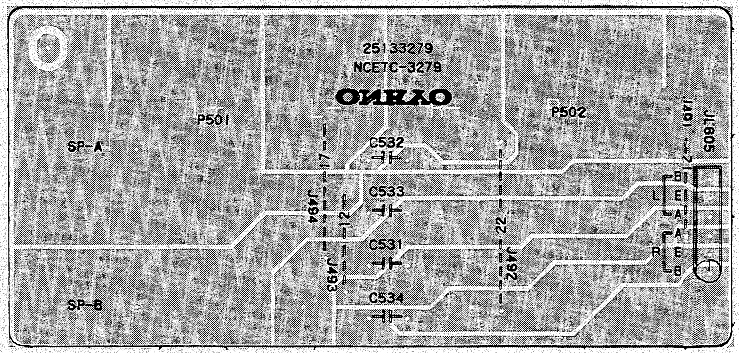
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE


S722 TAPE-2
S721 TAPE-1
S724 VCR-2
S723 VDP
S720 AM
S719 FM
S718 PHONO
S717 CD
S716 CD-D
USA ↔ OTHER
S714 SHIFT
S715 MUTE
S711 DOWN
S712 UP
S713 MEMORY
LC6527C-3987
LC6568H-3643
Q701
Q704
FL TUBE
U701
RL701
X701
X702
25133281E
NCDIS-3281
ONKYO

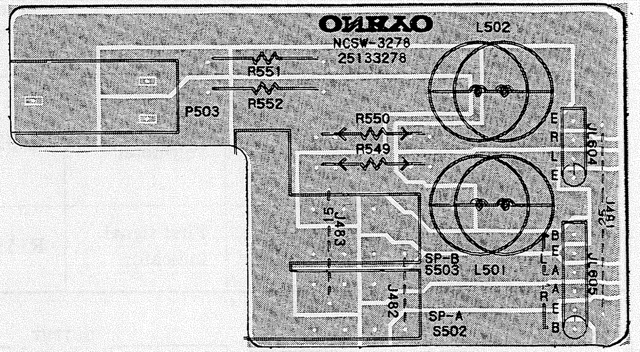
DISPLAY PC BOARD


BASS
TRE
BALANCE
R451
S354
25133283
ONKYO

PREAMPLIFIER PC BOARD


25133279
NCETC-3279
ONKYO
P501
P502
SP-A
SP-B

SPEAKER TERMINAL PC BOARD


ONKYO
NCSW-3278
25133278
L502
L501
P503
R551
R552
R550
R549
SP-B S503
SP-A S502

SPEAKER SWITCH PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

DISPLAY PC BOARD(NADIS-3281-3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
U701	24130001 or	GP1U501S or
	24130003	GP1U501×S
Q701	22240153	LC6568H-3643
Q704	22240243	LC6527C-3987
	Transistors	
Q702	2211255,	2SC1815(GR),
	2212485 or	JC501(Q) or
	2210746	2SC945A(P)
Q705	2211455,	2SA1015(GR),
	2212495 or	JA101(Q) or
	2210803	2SA733(P)
	Fluorescent tube	
Q703	212054	7-BT-95GK
	Lamp	
Q706	210064B	6.3V,0.25A
	Diodes	
D702-D715	223163	1SS133
D716,D717	223163	1SS133
D718	224650822,	HZ8.2EB2
	224150822 or	05AZ8.2Y, or
	224450822	MTZ8.2B
D719	223163	1SS133
D720	224150562,	05AZ5.6Y,
	224650562 or	HZ5.6EB2 or
	224450562	MTZ5.6B
D733-D736	223163	1SS133
	L.E.Ds	
D721,D723	225137CG,	SEL2413ECG,
D725,D727	225137DG or	SEL2413EDG or
D729-D731	224137DY	SEL2413EDY
D722,D724	225142	SEL2913K
D726,D728	225142	SEL2913K
D732	225141	SEL2213C
	Osc. elements	
X701	3010099	CSA4.00MG,Ceramic
X702	3010119	CSB-4.00MGW,Ceramic
	Capacitors	
C702	3020027 or	0.047F,5.5V or
	3000051	0.047F,5.5V,Super
C704	354780109	1 μF,50V,Elect.
C707,C715	354782299	0.22μF,50V,Elect.
C708	354741009	10μF,16V,Elect.
	Resistors	
R710	49163473404	47kohm×4, 1/10W,Network
R734,R735	49163104404	100kohm×4, 1/10W,Network
	Switches	
S701-S724	25035548	NPS-111-S510
	Relay	
RL701	25065298	NRL-1P1A-DC12-40
	Holder	
	27190643	L.E.D

SPEAKER SWITCH PC BOARD(NASW-3278-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
R549,R550	442520474	4.7ohm,1/2W,Metal oxide film resistors
R551,R552	441623914	390ohm,1W,Metal oxide film resistors
S502,S503	25035517	NPS-222-L479,Push switch
P503	25045187	HLJ-0541-01-010,Stereo headphone terminal
L501,L502	231001	S-1.3B,Coils

PREAMPLIFIER PC BOARD(NAAF-3283-3A)

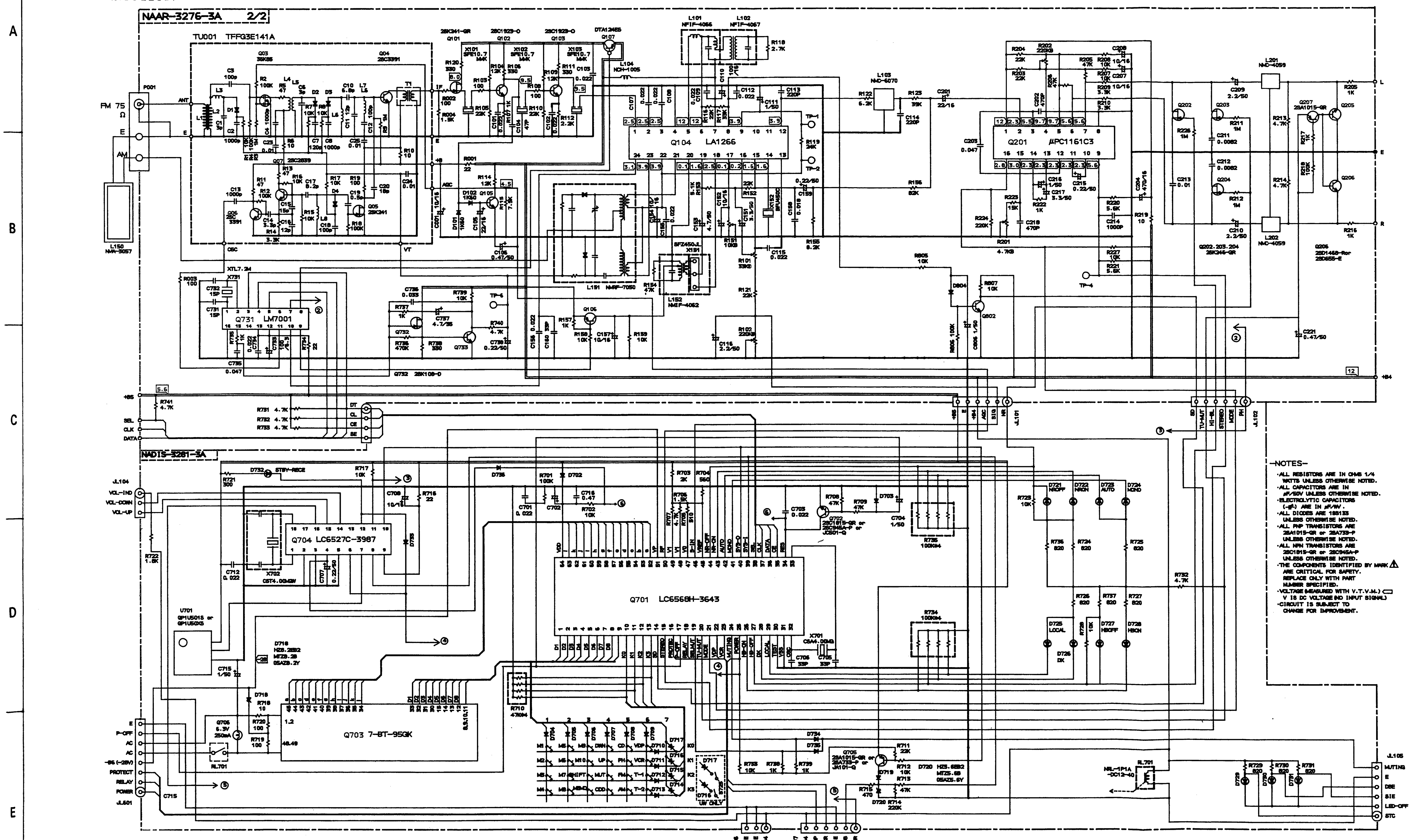
CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q352	222579 or	NJM4560D or
	222570	NJM4560DX
Q353	222465 or	NJM4558D or
	222502	NJM4558DX
	Transistors	
Q851	2212600	DTA124ES
Q853	221281	DTC114YS
	Diodes	
D351	224650623,	HZ6.2EB3,
	224450623 or	MTZ6.2C or
	224150623	05AZ6.2Z
D352,D353	223163	1SS133
	Capacitors	
C359,C360	354780229	2.2 μF,50V,Elect.
C363,C364	354741009	10μF,16V,Elect.
C367,C368	352983396	0.33μF,50V,Non-polar elect.
C373,C374	354780229	2.2 μF,50V,Elect.
C375-C378	354781099	0.1 μF,50V,Elect.
C389	354780229	2.2 μF,50V,Elect.
C390,C392	354781099	0.1 μF,50V,Elect.
C393,C851	354780339	3.3 μF,50V,Elect.
	Resistors	
R371,R372	5104216	N14RLC50KC22Z, Variable,Bass
R379,R380	5104216	N14RLC50KC22Z, Variable,Treble
R451	5104225	N11RGLC250KW22Z, Variable,Balance
	Switch	
S354	25035590	NPS-122-L552

SPEAKER TERMINAL PC BOARD(NAETC-3279-3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
P501,P502	25060110 or	NTM-4PDMN44 or
	25060039	NTM-4PDMN10, Speaker terminals

SCHEMATIC DIAGRAM

–TUNER SECTION–

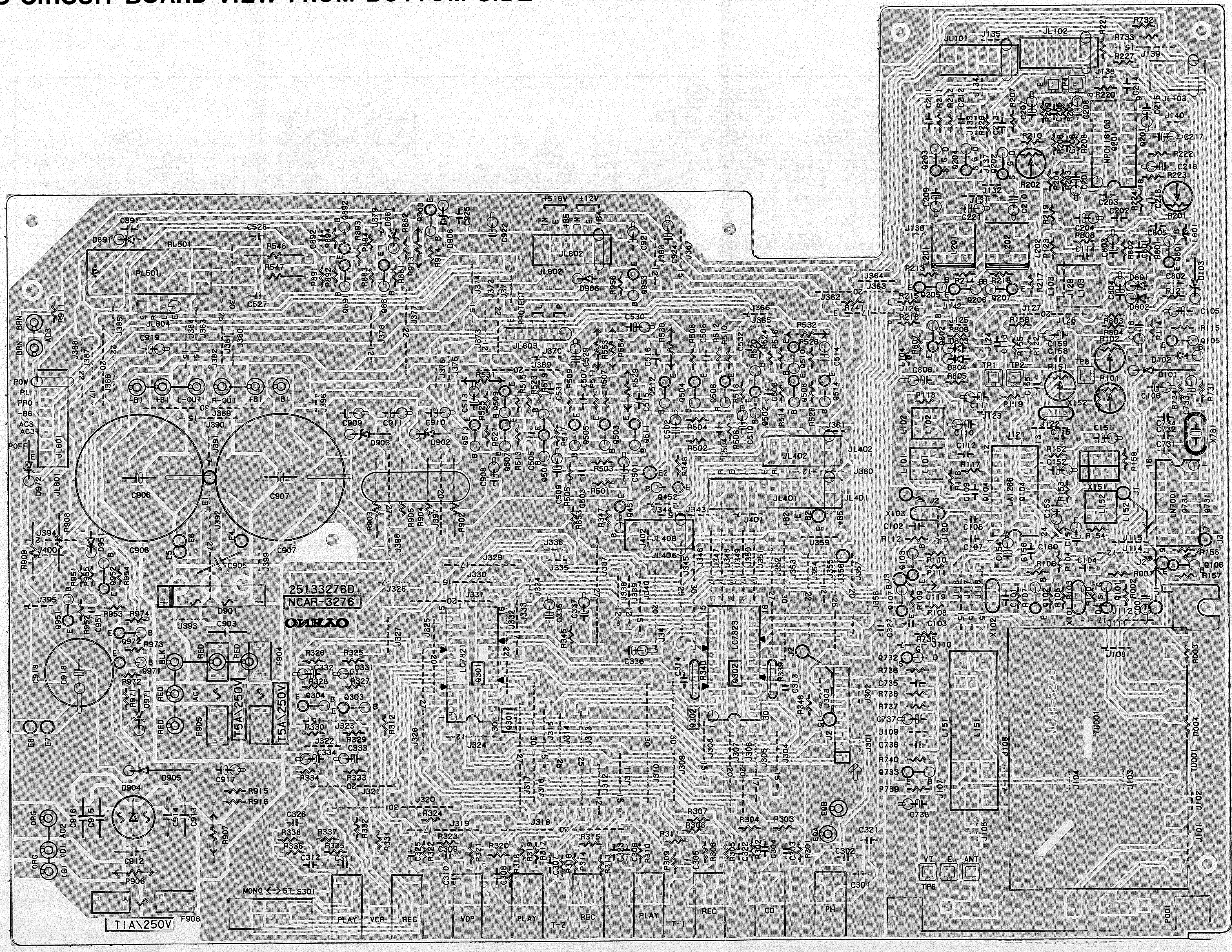

1
2
3
4
5
6
7
A
B
C
D
E
NAAR-3276-3A 2/2
TU001 TFFG3E141A
P001
FM 75 Ω
ANT
E
AM
L150 NMA-3057
Q101 2SK241-GR
Q102 2SC1923-O
Q103 2SC1923-O
Q107 DTA124ES
L104 NCH-1005
L101 NFIF-4055
L102 NFIF-4057
Q104 LA1266
L103 NMC-4070
Q201 μPC1161C3
L201 NMC-4059
L202 NMC-4059
Q202.203.204 2SK246-GR
Q205 2SD1468-Ror 2SD655-E
Q207 2SA1015-GR
L151 NMF-7050
L152 NMIF-4052
SFZ450JL X151
Q731 LM7001
X731 XTL7.2M
Q732 2SK109-D
Q733
Q105
Q106
Q802
TP-1
TP-2
TP-4
TP-5
L
E
R
+B4
NADIS-3261-3A
JL104
VOL-IND
VOL-DOWN
VOL-UP
Q704 LC6527C-3987
X702 CST4.00MGW
Q701 LC6568H-3643
X701 CSA4.00MG
Q702 2SC1815-GR or 2SC945A-P or JC501-Q
Q703 7-BT-95GK
U701 GP1U501S or GP1U50XS
Q705 2SA1015-GR or 2SA733-P or JA101-Q
Q706 6.3V 250mA
RL701
RL701 NRL-1P1A -DC12-40
JL101
JL102
JL105
JL106
JL107
JL501
+B5
SEL
CLK
DATA
DT
CL
CE
SE
E
P-OFF
AC
AC
-B5 (-28V)
PROTECT
RELAY
POWER
MUTING
DBE
SIE
LED-OFF
STC
VDP
VCR
SYS-BUS
PLAYER
D721 NROFF
D722 NRON
D723 AUTO
D724 MONO
D725 LOCAL
D726 DX
D727 HBOFF
D728 HBON
D716 UN ONLY

–NOTES–

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF/50V UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (-μF-) ARE IN μF/WV.
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH V.T.V.M.) ▭ V IS DC VOLTAGE (NO INPUT SIGNAL)
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

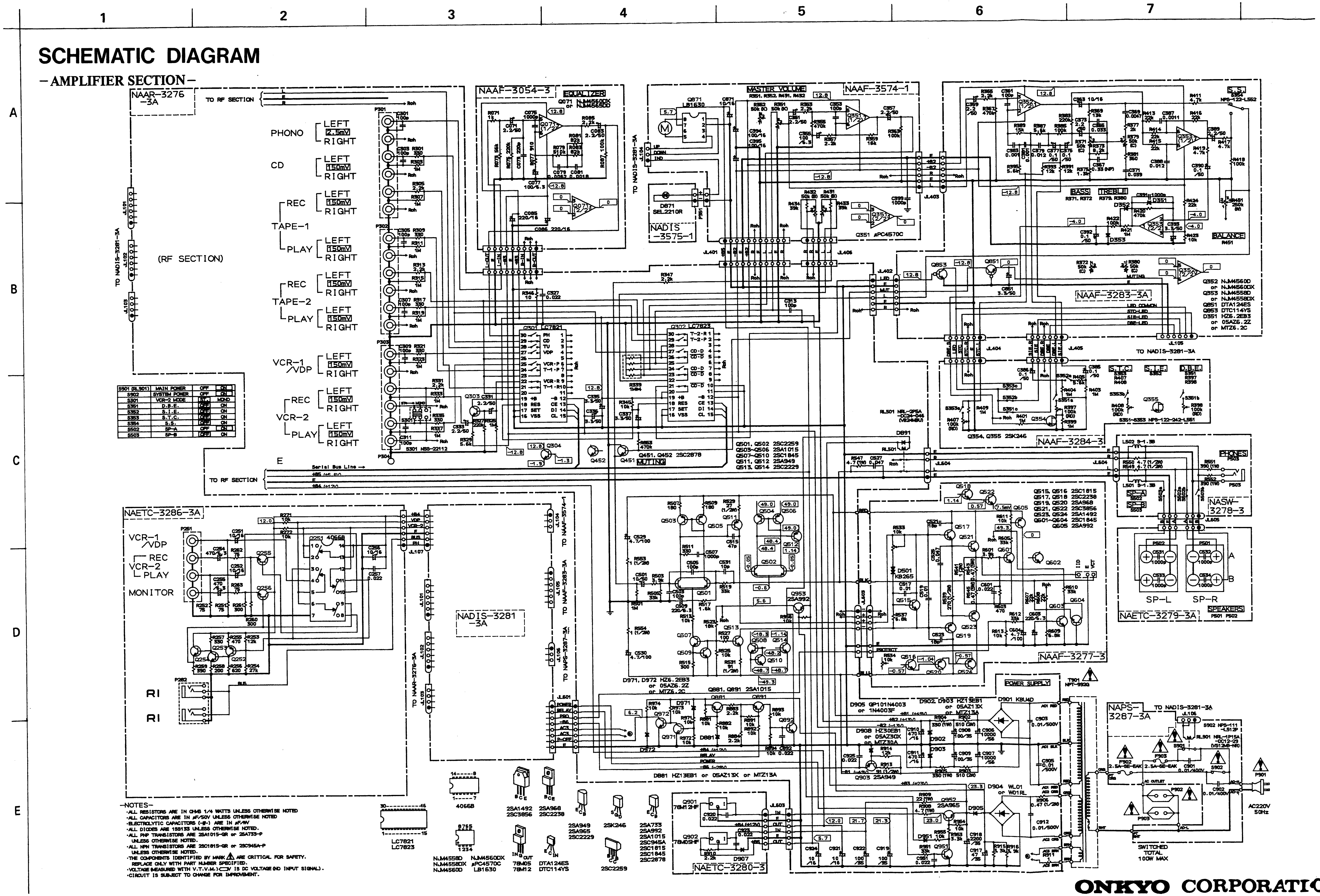
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE


25133276D
NCAR-3276
ONKYO
T1A\250V
T5A\250V
T5A\250V
F906
MONO ⟷ ST S301
PLAY
VCR
REC
VDP
PLAY
T-2
REC
PLAY
T-1
REC
CD
PH
VT
E
ANT
TP6
TP1
TP2
TP8
NCAR-3276
TU001
P001
-B1
+B1
L-OUT
R-OUT
+B1
B1
POW
RL
PRO
-B6
AC3
AC3
POFF
BRN
BRN
ORG
ORG
RED
RED
BLK
+5 6V
+12V
PROTECT
C906
C907
C918
JL601
JL602
JL603
JL604
JL802
RL501
LC7821
LC7823
LA1266
LM7001
MPC1181C3
X151
X731
L151

AM/FM TUNER AND SELECTOR CIRCUIT PC BOARD

SCHEMATIC DIAGRAM

-AMPLIFIER SECTION-


1
2
3
4
5
6
7
A
B
C
D
E
NAAR-3276-3A
TO RF SECTION
(RF SECTION)
TO NADIS-3281-3A
PHONO LEFT 2.5mV RIGHT
CD LEFT 150mV RIGHT
TAPE-1 REC LEFT 150mV RIGHT
TAPE-1 PLAY LEFT 150mV RIGHT
TAPE-2 REC LEFT 150mV RIGHT
TAPE-2 PLAY LEFT 150mV RIGHT
VCR-1 /VDP LEFT 150mV RIGHT
VCR-2 REC LEFT 150mV RIGHT
VCR-2 PLAY LEFT 150mV RIGHT
NAAF-3054-3
EQUALIZER
Q071 NJM4560DX or NJM4558DX
Q301 LC7821
Q302 LC7823
NADIS-3575-1
D871 SEL2210R
MASTER VOLUME
Q871 LB1630
NAAF-3574-1
Q351 μPC4570C
BASS
TREBLE
BALANCE
S.S.
NAAF-3283-3A
Q352 NJM4560D or NJM4560DX
Q353 NJM4558D or NJM4558DX
Q851 DTA124ES
Q853 DTC114YS
D351 HZ6.2EB3 or 05AZ6.2Z or MTZ6.2C
NAAF-3284-3
S.T.C.
S.I.E.
D.B.E.
Q354, Q355 2SK246
Q451, Q452 2SC2878
MUTING
Serial Bus Line
Q501, Q502 2SC2259
Q503-Q506 2SA1015
Q507-Q510 2SC1845
Q511, Q512 2SA949
Q513, Q514 2SC2229
Q515, Q516 2SC1815
Q517, Q518 2SC2238
Q519, Q520 2SA968
Q521, Q522 2SC3856
Q523, Q524 2SA1492
Q601-Q604 2SC1845
Q605 2SA992
NAAF-3277-3
RL501 NRL-2P5A
PHONES
SP-A
SP-B
NASW-3278-3
SP-L
SP-R
SPEAKERS
NAETC-3279-3A
NAETC-3286-3A
VCR-1 /VDP
VCR-2 REC
VCR-2 PLAY
MONITOR
Q251 4066B
RI
RI
NADIS-3281-3A
TO NAAF-3574-1
TO NAAF-3283-3A
TO NAPS-3287-3A
TO NAAR-3276-3A
D971, D972 HZ6.2EB3 or 05AZ6.2Z or MTZ6.2C
Q881, Q891 2SA1015
D881 HZ13EB1 or 05AZ13X or MTZ13A
POWER SUPPLY
T901 NPT-992Q
D901 KBU4D
D902, D903 HZ13EB1 or 05AZ13X or MTZ13A
D905 GP10Y N4003F or 1N4003F
D908 HZ30EB1 or 05AZ30X or MTZ30A
Q903 2SA949
D904 WL01 or W01RL
Q951 Q952 2SA965
NAPS-3287-3A
TO NADIS-3281-3A
S902 NPS-111-L512P
RL901 NRL-1P15A-DC12-29
AC OUTLET
SWITCHED TOTAL 100W MAX
AC220V 50Hz
Q901 78M12HF
Q902 78M05HF
NAETC-3280-3
4066B
2SA1492 2SC3856
2SA968 2SC2238
2SA949 2SA965 2SC2229
2SK246
2SA733 2SA992 2SA1015 2SC945A 2SC1815 2SC1845 2SC2878
LC7821 LC7823
NJM4558D NJM4558DX NJM4560D
NJM4560DX μPC4570C LB1630
78M05 78M12
DTA124ES DTC114YS
2SC2259

S901 (RL901)	MAIN POWER	OFF	ON
S902	SYSTEM POWER	OFF	ON
S301	VCR-2 MODE	ST.	MONO
S351	D.B.E.	OFF	ON
S352	S.I.E.	OFF	ON
S353	S.T.C.	OFF	ON
S354	S.S.	OFF	ON
S502	SP-A	OFF	ON
S503	SP-B	OFF	ON

-NOTES-

- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED
- ALL CAPACITORS ARE IN μF/50V UNLESS OTHERWISE NOTED
- ELECTROLYTIC CAPACITORS (-‖-) ARE IN μF/WV
- ALL DIODES ARE 1SS133 UNLESS OTHERWISE NOTED.
- ALL PNP TRANSISTORS ARE 2SA1015-GR or 2SA733-P UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE 2SC1815-GR or 2SC945A-P UNLESS OTHERWISE NOTED.
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH V.T.V.M.) ▭V IS DC VOLTAGE (NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

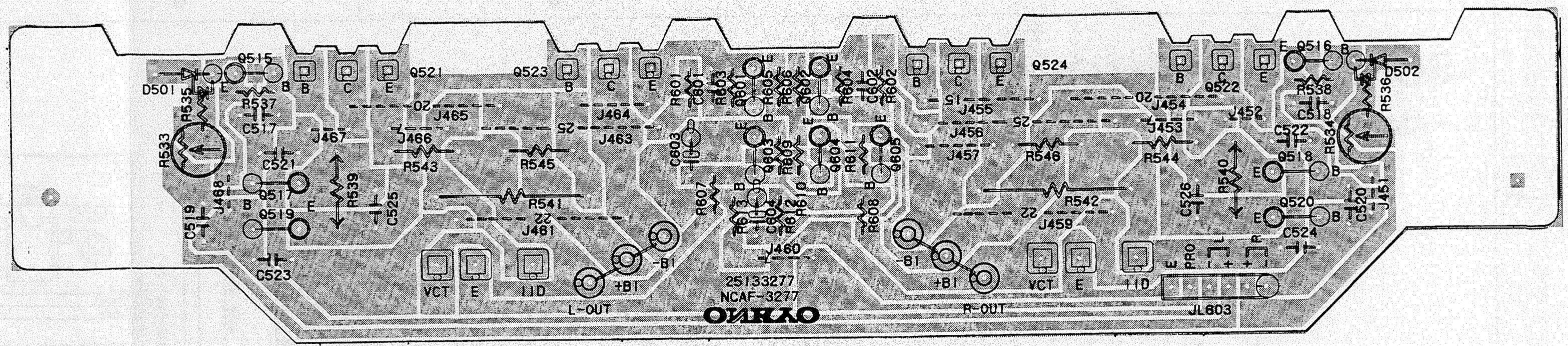
ONKYO CORPORATION

PRINTED CIRCUIT BOARD-PARTS LIST

FM/AM TUNER AND SELECTOR CIRCUIT PC BOARD(NAAR -3276-3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240081	TFFG3E 141
	ICs	
Q104	22240039	LA1266
Q201	222678	μPC1161C3
Q301	22240079	LC7821
Q302	22240158	LC7823
Q731	22240090	LM7001
	Transistors	
Q101	2212195	2SK241(GR)
Q102	2211723	2SC1923(O)
Q103	2211723	2SC1923(O)
Q105	2211255 or	2SC1815(GR) or
	2210746	2SC945A(P)
Q106,Q207	2211455	2SA1015(GR)
Q107	2212600	DTA124ES
Q202-Q204	2211945	2SK246(GR)
Q205,Q206	2211705 or	2SD655(E) or
	2212794	2SD1468(R)
Q303,Q304	2211255 or	2SC1815(GR) or
	2210746	2SC945A(P)
Q451,Q452	2212285 or	2SC2878(A) or
	2212286	2SC2878(B)
Q501,Q502	2211371 or	2SC2259(O-001) or
	2211372	2SC2259(O-002)
Q503-Q506	2211455	2SA1015(GR)
Q507-Q510	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q511,Q512	2211353 or	2SA949(O) or
	2211354	2SA949(Y)
Q513,Q514	2211633 or	2SC2229(O) or
	2211634	2SC2229(Y)
Q732	2212294	2SK108(D)
Q733	2211255 or	2SC1815(GR) or
Q802,Q892	2210746	2SC945A(P)
Q881,Q891	2211455	2SA1015(GR)
Q903	2211353 or	2SA949(O) or
	2211354	2SA949(Y)
Q951,Q971	2211255 or	2SC1815(GR) or
Q972	2210746	2SC945A(P)
Q952	2211643 or	2SA965(O) or
	2211644	2SA965(Y)
Q953	2211792 or	2SA992(F) or
	2211793	2SA992(E)
	Diodes	
D101,D102	223132	1K60
D804	223163	1SS133
D891	223163	1SS133
D901	22380024	KBU4D
D902,D903	224151301,	05AZ13X,
D881	224451301 or	MTZ13A or
	224651301	HZ13EB1
D904	223862 or	WL01 or
	223890	W01RL
D905	223880 or	GP101N4003 or
	223896	1N4003F
D908	224153001,	05AZ30X,
	224453001 or	MTZ30A or
	224653001	HZ30EB1
D951	223163	1SS133
D971,D972	224650623,	HZ6.2EB3,
	224450623 or	MTZ6.2C or
	224150623	05AZ6.2Z
	Transformers	
L101	233389	NFIF-4066
L102	233390	NFIF-4067
L152	232139	NMIF-4062
	Coils	
L103	233383	NMC-6070
L104	233105	NCH-1005
L201,L202	233355A	NMC-4059
	RF block	
L151	232148	NMRF-7050
	Ceramic filters	
X101-X103	3010137	SFE10.7MMK
X151	3010123	SFZ450JL
X152	3010076	BFU450C
	X'tal	
X731	3010141	XTL-7.2M
	Capacitors	
C001	354741009	10μF,16V,Elect.
C105	354742209	22μF,16V,Elect.
C106	354784799	0.47μF,50V,Elect.
C110	354741019	100 μF,16V,Elect.
C111	354780109	1 μF,50V,Elect.
C116	354780229	2.2 μF,50V,Elect.
C151	354780339	3.3 μF,50V,Elect.
C152	354741009	10μF,16V,Elect.
C153	354780479	4.7 μF,50V,Elect.
C154,C157	354741009	10μF,16V,Elect.
C159	354782299	0.22μF,50V,Elect.
C201	354742209	22μF,16V,Elect.
C204	354744719	470 μF,16V,Elect.
C207,C208	354741009	10μF,16V,Elect.
C209,C210	354780229	2.2 μF,50V,Elect.
C215	354782299	0.22μF,50V,Elect.
C216	354780109	1 μF,50V,Elect.
C217	354780339	3.3 μF,50V,Elect.
C218	370134714	470pF ±5%,100V,APS
C221	354784799	0.47μF,50V,Elect.
C331-C334	354780229	2.2 μF,50V,Elect.
C335-C337	354780339	3.3 μF,50V,Elect.
C501,C502	354781009	10μF,50V,Elect.
C509,C510	354722219	220 μF, 6.3V,Elect.
C529,C530	354790479	4.7 μF, 100V,Elect.
C733	354721019	100 μF, 6.3V,Elect.
C737	354780479	4.7 μF,50V,Elect.
C738	354782299	0.22μF,50V,Elect.
C806	354780109	1 μF,50V,Elect.
C903,C905	335251039	0.01μF,500V,Ceramic
C906,C907	3504224	10000 μF,56V,Elect.
C908,C909	354761019	100 μF,35V,Elect.
C910,C911	354744719	470 μF,16V,Elect.
C912	335251039	0.01μF,500V,Ceramic
C917	354764709	47μF,35V,Elect.
C918	354762229	2200μF,35V,Elect.
C919	354761019	100 μF,35V,Elect.
C921,C924	354741009	10μF,16V,Elect.
C922	354761019	100 μF,35V,Elect.
	Resistors	
R101	5210067	N06HR33KBD,Semi-fixed
R102	5210072	N06HR220KBD,Semi-fixed
R151	5210064	N06HR10KBD,Semi-fixed
R201	5210062	N06HR4.7KBD,Semi-fixed
R202	5210072	N06HR220KBD,Semi-fixed
R339,R340	49163105404	1Mohm ×4,1/10W,Network
R529,R530	442522704	27ohm,1/2W,Metal oxide film
R531,R532	442529104	91ohm,1/2W,Metal oxide film
R547,R548	441620474	4.7ohm,1W,Metal oxide film
R553,R554	442520104	1ohm,1/2W,Metal oxide film
R902,R903	441725114	510ohm,2W,Metal oxide film
R904,R905	441623314	330ohm,1W,Metal oxide film
R906	442524794	0.47ohm, 1/2W,Metal oxide film
R908	441620474	4.7ohm,1W,Metal oxide film
R909	441622204	22ohm,1W,Metal oxide film
R913	442529104	91ohm, 1/2W,Metal oxide film
	Relay	
RL501	25065339	NRL-2P5A-DC24-046
	Terminals	
P001	25060087	NTM-2PDMN31,Antenna
P301-P303	25045213	NPJ-6PDBL-92
	Switch	
S301	25065286	NPS-22112,VCR mode
	Sockets	
P101,P102	25050270	NSCT-6P98
P402,P602	25050270	NSCT-6P98
P103	25050268	NSCT-4P96
P401	25050275	NSCT-11P103
P601	25050272	NSCT-8P100
JL406	25050269	NSCT-5P97
	Radiator	
	27160166	

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



POWER AMPLIFIER PC BOARD

POWER AMPLIFIER PC BOARD(NAAF-3277-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q515,Q516	2211255	2SC1815(GR)
Q517,Q518	2200863 or	2SC2238(O) or
	2200864	2SC2238(Y)
Q519,Q520	2200873 or	2SA968(O) or
	2200874	2SA968(Y)
Q521,Q522 ☆	2201653,	2SC3856(O),
	2201654 or	2SC3856(Y) or
	2201655	2SC3856(P)
Q523,Q524 ☆	2201663,	2SA1492(O),
	2201664 or	2SA1492(Y) or
	2201665	2SA1492(P)

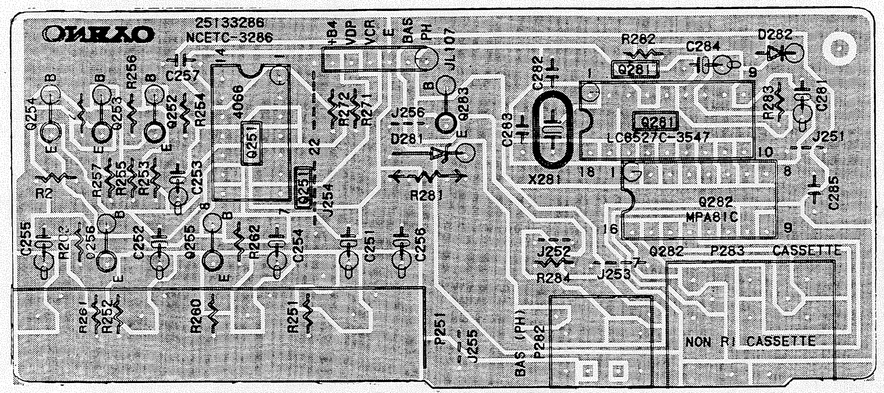
CAUTION: Replacement for transistor of mark ☆,if necessary, must be made from the same beta group (H_{FE}) as the original type.

Ex. 2SC3856(O) 2SA1492(O)

Same beta group

CIRCUIT NO.	PART NO.	DESCRIPTION
Q601-Q604	2211732 or	2SC1845(F) or
	2211733	2SC1845(E)
Q605	2211792 or	2SA992(F) or
	2211793	2SA992(E)
	Diodes	
D501,D502	4000120	KB265
	Capacitors	
C603	354722219	220 μF, 6.3V,Elect.
C604	354790479	4.7 μF, 100V,Elect.
	Resistors	
R533,R534	5210064	N06HR10KBD,Semi-fixed
R539,R540	442522714	270ohm,1/2W,Metal oxide film
R541,R542	441720104	1ohm,2W,Metal oxide film
R543-R546	4000080 or	0.47ohm,5W,Metal plate
	4500022	
	Terminals	
	25060118	NTM-1S52,For leg of power transistor

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE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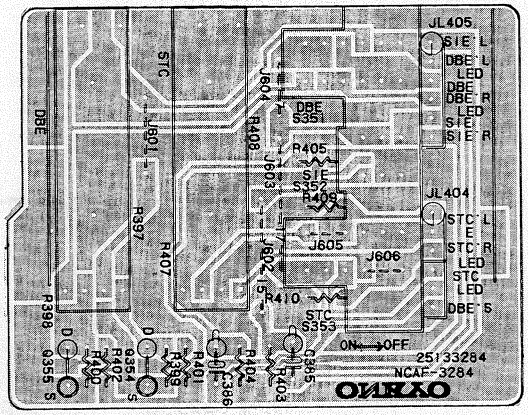
NCETC-3286
ONKYO
LC6527C-3547
CASSETTE
NON RI CASSETTE

VIDEO TERMINAL PC BOARD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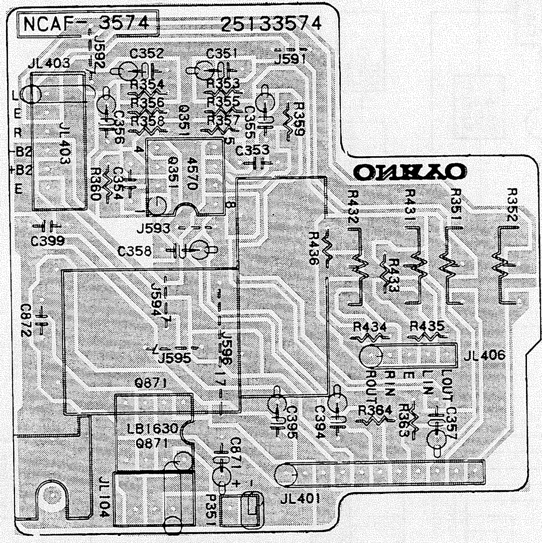
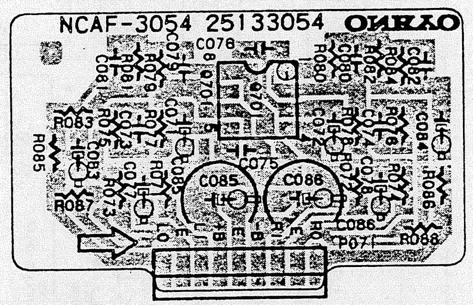
NCAF-3284
ONKYO
ON ⟷ OFF
DBE
STC

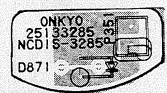
SWITCH PC BOARD


NCAF-3574
25133574
ONKYO
LB1630

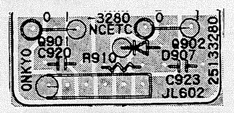
VOLUME PC BOARD


NCAF-3054 25133054
ONKYO

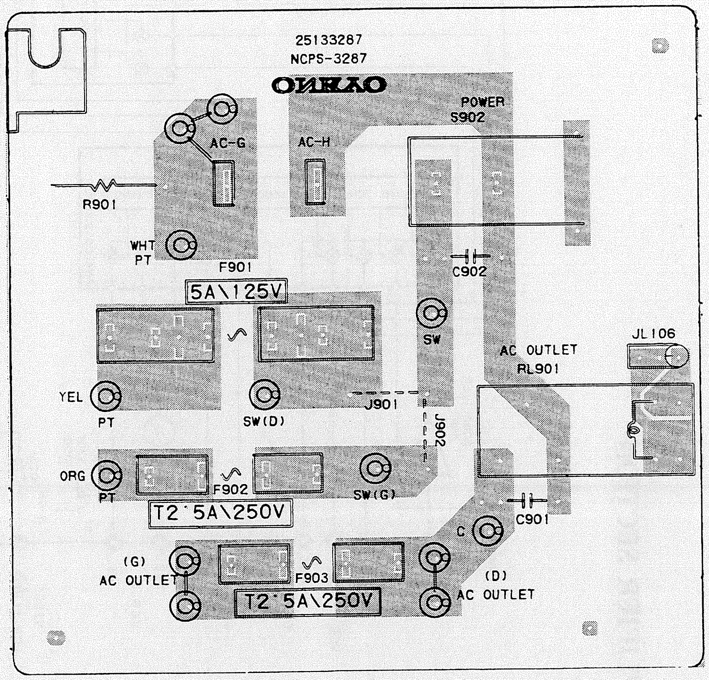
EQUALIZER AMPLIFIER PC BOARD


ONKYO
25133285
NCDIS-3285
D871

VOLUME INDICATOR PC BOARD


ONKYO
3280
NCETC
25133280
JL602

CONST. VOLTAGE CIRCUIT PC BOARD


25133287
NCPS-3287
ONKYO
POWER
S902
AC-G
AC-H
R901
WHT
PT
F901
5A\125V
C902
SW
AC OUTLET
RL901
JL106
YEL
PT
SW(D)
J901
J902
ORG
PT
F902
SW(G)
T2 5A\250V
C
C901
(G)
AC OUTLET
F903
T2 5A\250V
(D)
AC OUTLET

POWER SUPPLY CIRCUIT PC BOARD

PRINTED CIRCUIT BOARD-PARTS LIST

VIDEO TERMINAL PC BOARD(NAETC-3286-3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q251	222840661	4066B
	Transistors	
Q252	2211455 or 2210803	2SA1015(GR) or 2SA733(P)
Q253-Q256	2211255 or 2210746	2SC1815(GR) or 2SC945A(P)
	Capacitors	
C251,C252	354741009	10μF,16V,Elect.
C254,C255	354724719	470 μF,6.3V,Elect.
C256	354741009	10μF,16V,Elect.
	Terminals	
P251	25045216	NPJ-4PDBL94
P282	25045172	HSJ1003-01-020

VOLUME PC BOARD(NAAF-3574-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q351	22240050	μPC4570C,IC
Q871	222963	LB1630,IC
C351,C352	354780229	2.2 μF,50V,Elect. capacitors
C355,C356	354721019	100 μF,6.3V, Elect. capacitors
C357,C358	354780229	2.2 μF,50V,Elect. capacitors
C394,C395	354741019	100 μF,16V,Elect. capacitors
C871	354741009	10μF,16V,Elect. capacitor
R351,R352 R431,R432	5144009C	N16RGL50KA 50KB 30F,Variable resistor,Volume
P351	2000635A	NSAS-4P591,Socket
JL403	25050270	NSCT-6P98,Socket
JL104	25050267	NSCT-3P95,Socket

VOLUME INDICATOR PC BOARD(NADIS-3575-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
D871	225241 or 225242 27190545	SEL2210R-C or SEL2210R-D,LED Holder,LED

CONST. VOLTAGE CIRCUIT PC BOARD(NAETC-3280-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q901	222780125NEC	78M12HF,IC
Q902	222780055NEC	78M05HF,IC
D907	223163	1SS133,Diode

SWITCH PC BOARD(NAAF-3284-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q354,Q355	2211945	2SK246(GR)
	Capacitors	
C385,C386	354781099	0.1 μF,50V,Elect.
	Resistors	
R397,R398	6182003	N25LGL100KRD10Z,Variable,D.B.E
R407,R408	6182003	N25LGL100KRD10Z,Variable,S.T.C
	Switches	
S351-S353	25035589	NPS-122-242-L551

EQUALIZER AMPLIFIER PC BOARD(NAAF-3054-3)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q071	22240191 or 222570	NJM4565DD or NJM4560DX
	Elect. capacitors	
C071,C072	354780229	2.2 μF,50V
C077,C078	354721019	100 μF,6.3V
C083,C084	354780229	2.2 μF,50V
C085,C086	354742219	220 μF,16V
	Plug	
P071	25055334	NPLG-9P317

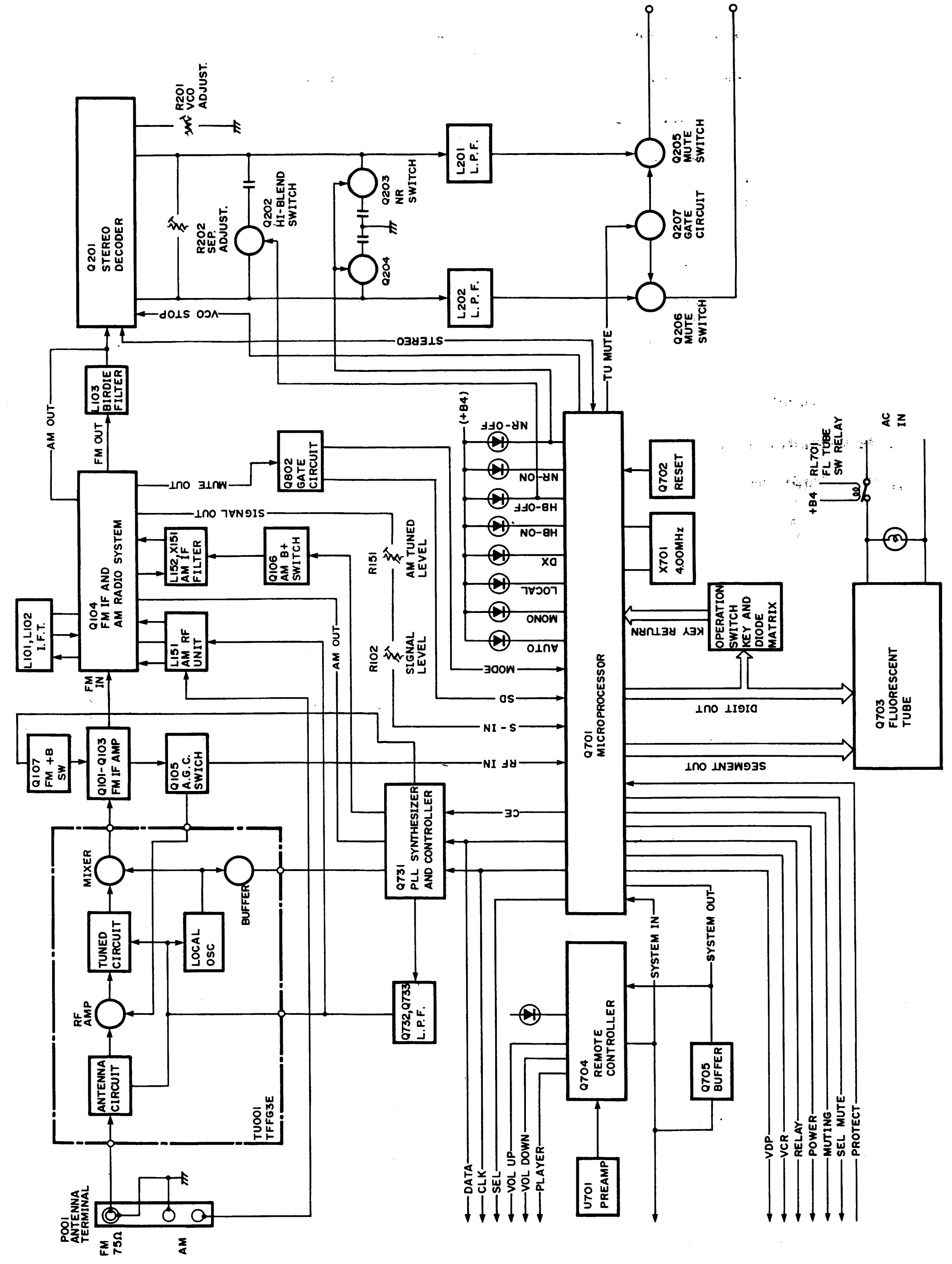
POWER SUPPLY CIRCUIT PC BOARD(NAPS-3287-3A)

CIRCUIT NO.	PART NO.	DESCRIPTION
C901,C902	3500065A	⚠DE7150FZ103PAC400V/125V, Capacitor IS
S902	25035550	⚠NPS-111-L512P,Power
RL901	25065248	⚠NRL-1P15A-DC12-29,Relay
F902a	25050065	⚠YSH-403T,Fuseholders
F902	252075	⚠2.5A-SE-EAK,Primary fuse
F903a	25050065	⚠YSH-403T,Fuseholders
F903	252075	⚠2.5A-SE-EAK,Fuse for AC outlet

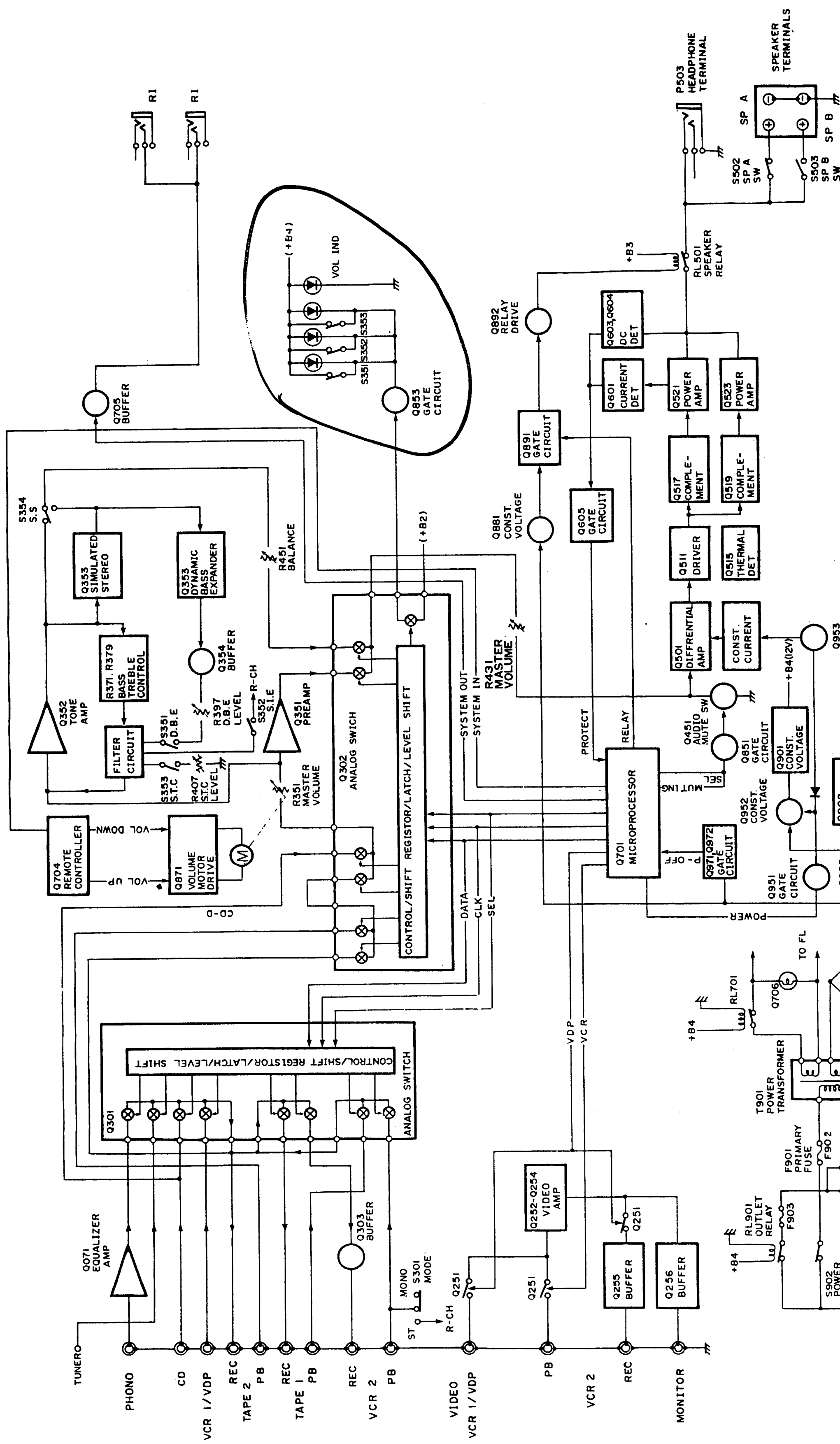
NOTE:THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

BLOCK DIAGRAM

TUNER SECTION


P001 ANTENNA TERMINAL
FM 75Ω
AM
TU001 TFFG3E
ANTENNA CIRCUIT
RF AMP
TUNED CIRCUIT
MIXER
LOCAL OSC
BUFFER
Q107 FM +B SW
Q101-Q103 FM IF AMP
Q105 A.G.C. SWICH
Q104 FM IF AND AM RADIO SYSTEM
L101, L102 I.F.T.
L151 AM RF UNIT
L152, X151 AM IF FILTER
Q106 AM B+ SWITCH
L103 BIRDIE FILTER
Q802 GATE CIRCUIT
Q201 STEREO DECODER
R201 VCO ADJUST.
R202 SEP. ADJUST.
Q202 HI-BLEND SWITCH
Q203 NR SWITCH
Q204
L201 L.P.F.
L202 L.P.F.
Q205 MUTE SWITCH
Q206 MUTE SWITCH
Q207 GATE CIRCUIT
Q731 PLL SYNTHESIZER AND CONTROLLER
Q732, Q733 L.P.F.
Q701 MICROPROCESSOR
Q702 RESET
X701 4.00MHz
OPERATION SWITCH KEY AND DIODE MATRIX
Q703 FLUORESCENT TUBE
RL701 FL TUBE SW RELAY
AC IN
Q704 REMOTE CONTROLLER
Q705 BUFFER
U701 PREAMP
R151 AM TUNED LEVEL
R102 SIGNAL LEVEL
AM OUT
FM OUT
MUTE OUT
SIGNAL OUT
VCO STOP
STEREO
TU MUTE
NR-OFF
NR-ON
HB-OFF
HB-ON
DX
LOCAL
MONO
AUTO
MODE
SD
S-IN
RF IN
CE
KEY RETURN
DIGIT OUT
SEGMENT OUT
SYSTEM IN
SYSTEM OUT
DATA
CLK
SEL
VOL UP
VOL DOWN
PLAYER
VDP
VCR
RELAY
POWER
MUTING
SEL MUTE
PROTECT

AMPLIFIER SECTION

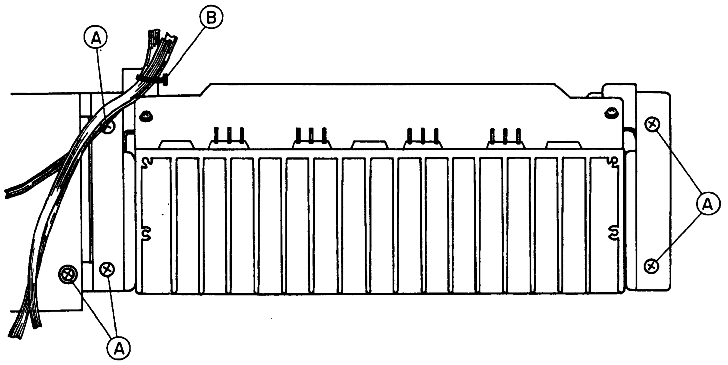

TUNER
PHONO
CD
VCR 1/VDP
REC TAPE 2 PB
REC TAPE 1 PB
REC VCR 2 PB
VIDEO VCR 1/VDP
PB
VCR 2
REC
MONITOR
Q071 EQUALIZER AMP
Q301 ANALOG SWITCH
CONTROL/SHIFT REGISTOR/LATCH/LEVEL SHIFT
Q303 BUFFER
S301 MODE
MONO
ST
R-CH
Q251
Q252-Q254 VIDEO AMP
Q255 BUFFER
Q256 BUFFER
Q704 REMOTE CONTROLLER
Q871 VOLUME MOTOR DRIVE
VOL UP
VOL DOWN
CD-D
Q352 TONE AMP
R371, R379 BASS TREBLE CONTROL
Q353 SIMULATED STEREO
S354 S.S.
Q333 DYNAMIC BASS EXPANDER
Q354 BUFFER
FILTER CIRCUIT
S353 S.T.C
S351 D.B.E
R407 S.T.C LEVEL
R397 D.B.E LEVEL
S352 S.T.E
Q351 PREAMP
R351 MASTER VOLUME
Q302 ANALOG SWICH
R451 BALANCE
R431 MASTER VOLUME
Q705 BUFFER
RI
VOL IND
S351, S352, S353
Q855 GATE CIRCUIT
SYSTEM OUT
SYSTEM IN
DATA
CLK
SEL
VDP
VCR
PROTECT
RELAY
MUTING
SEL
P-OFF
POWER
Q701 MICROPROCESSOR
Q971, Q972 GATE CIRCUIT
Q881 CONST. VOLTAGE
Q891 GATE CIRCUIT
Q892 RELAY DRIVE
Q605 GATE CIRCUIT
Q603, Q604 DC DET
Q601 CURRENT DET
Q501 DIFFRENTIAL AMP
CONST. CURRENT
Q511 DRIVER
Q515 THERMAL DET
Q517 COMPLE-MENT
Q519 COMPLE-MENT
Q521 POWER AMP
Q523 POWER AMP
Q451 AUDIO MUTE SW
Q851 GATE CIRCUIT
Q953 GATE CIRCUIT
Q952 CONST. VOLTAGE
Q901 CONST. VOLTAGE
Q902 CONST. VOLTAGE
Q903 CONST. VOLTAGE
Q951 GATE CIRCUIT
D905
D901
D902
D903
D904
RL501 SPEAKER RELAY
P503 HEADPHONE TERMINAL
SPEAKER TERMINALS
SP A
SP B
S502 SP A SW
S503 SP B SW
+B3
+B4
+B4(12V)
+B5(5V)
+B3(22V)
+B1(47V)
+B2(13V)
-B1(-47V)
-B6(-28V)
-B2(-13V)
(+B2)
TO FL
RL701
Q706
T901 POWER TRANSFORMER
F901 PRIMARY FUSE
F902
F903
RL901 OUTLET RELAY
P902 AC OUTLET
S902 POWER SW

DISASSEMBLING PROCEDURES

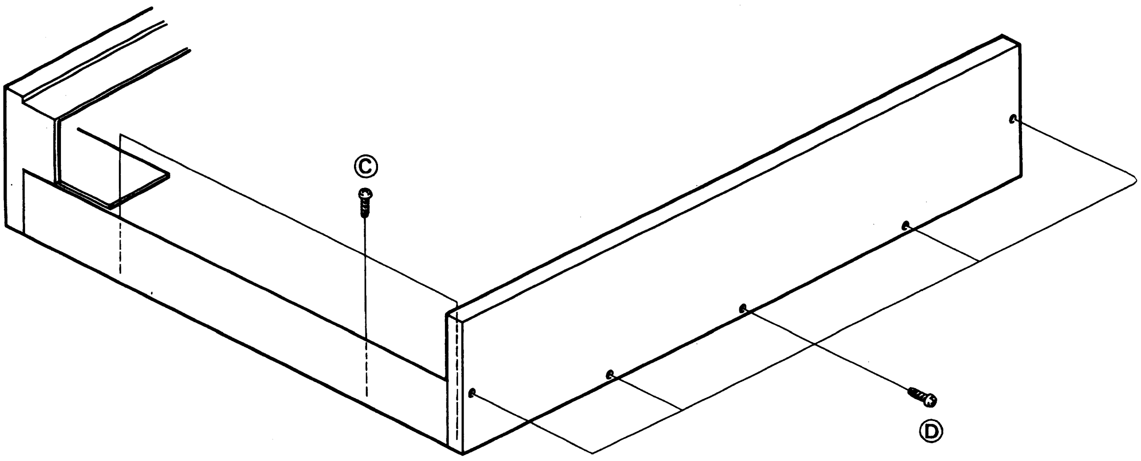
1. Top cover
Remove a screw (3TTS+8BQ(BC)) holding the top cover and the back panel.
Remove the four screws (3TTS+8B(BC)) holding the back panel and the chassis.

2. Front panel
Remove the top cover.
Remove the six screws (3TTP+8P(BC)) holding the front panel and the front backet.

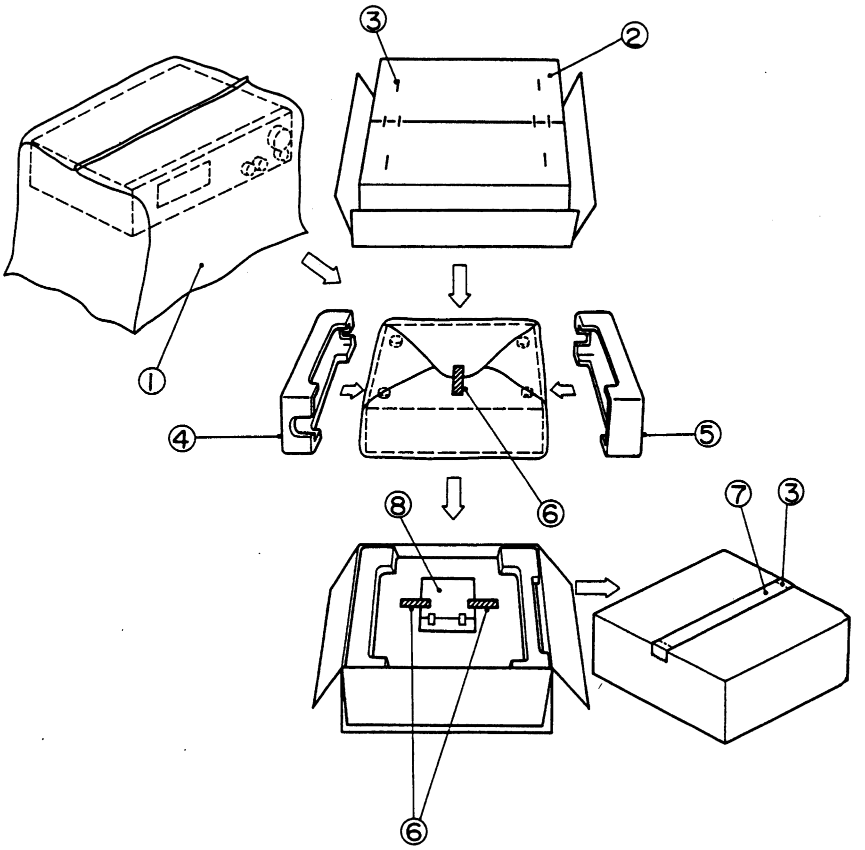
3. Power amplifier pc board
Remove the top cover.
Remove the five screws A.
Cut the binder B.



4. FM/AM tuner and selector switch pc board
Remove the top cover.
Remove the three screws C holding the pc board and chassis.
Remove the five screws D holding the back panel and chassis.
Remove the pc board from the two holders.



PACKING VIEW



REF. NO.	PART NO.	DESCRIPTION
1	29100034	850×650mm,Poly-vinyl bag
2	29051912	Master carton box
3	282320	Sealing hook
4	29091263A	Pad R
5	29091262A	Pad L
6	261504	Adhesive tape
7	29110046	Damplon tape
8	Accessary bag ass'y	
	29341410	Instruction manual
	292092	FM antenna
	232140	NMA-3057,AM loop antenna
	2010169	Connection cord for RI
	3010124	UM-4,Two batteries
	24140149	RC-149S,Remote control transmitter
	29100097	250×350mm,Poly-vinyl bag
	29365020	Warranty card
	29100094A	Poly-vinyl bag for warranty card

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